Vero Scientific

USER MANUAL

VeroCor

COPPER CORROSION BATH

VeroCor is a compact unit with six sample positions, dual temperature zones, and precise temperature control. Easy to operate, it's perfect for various testing standards, including ASTM D130, which measures the corrosion of copper by petroleum products. The unit ensures reliable performance with a leak-proof aluminum chamber.

TABLE OF

CONTENTS

INSTRUMENT

FEATURES & OPERATIONS

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PRODUCT DESCRIPTION

The VeroCor is a state of art unit, single aluminum block with six sample positions, each group of three positions has separated temperature controller.

A universal system that could be used for wide range of standards, the unit is provided with different sample inserts to accomudate difrent sample cups.

FEATURES

- Digital performance at analog prices.
- Microprocessor controller with digital display.
- Leak-proof aluminium heating chamber.
- Single block mode, with dual temperature areas.

INSTALLATION INSTRUCTIONS

System ready to ‘Plug and Play’. The unit should only be used on a sturdy, level surface in a safe, dry place.

BASIC

OPERATING INSTRUCTIONS

BASIC OPERATING INSTRUCTIONS

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INSTRUMENT DETAILS

1. Samples Block | 2. Temperature Control GA | 3. Heater GA On/Off | 4. Heater GB On/Off | 5. Temperature Control GB | GA. Group A | GB. Group B

Figure 1: Unit Details

BASIC OPERATING INSTRUCTIONS

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OPERATING INSTRUCTIONS

1. Place the unit on a sturdy, level surface in a safe, dry place, away from laboratory traffic.

2. Ensure that the AC power switch is OFF, then plug the power cord into a grounded AC outlet of appropriate voltage (220 V as indicated on the rating sticker near the AC cord on the back of the unit).

Figure 2: **Temperature Controller**

3. Turn the AC power ON.

4. Push On any Group of samples you prefer to use GB or GA.

Figure 3: **On/Off buttons**

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OPERATING INSTRUCTIONS

5. Use the temperature controller to set the test tempeature for the group of sample positions GA or GB.

Figure 4: **Temperature controller**

6. Use the insert suits the test method you need to perform and put it inside the block.

Figure 5: **Supplies**

ASTM D130

TEST PROCEDURE

ASTM D130 TEST PROCEDURE

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PREPARATION OF TEST STRIPS

Surface Preparation

Remove all surface blemishes from all six sides of the strip obtained from a previous analysis. One way to accomplish this is to use 00 grade or finer steel wool or silicon carbide paper or cloth of such degrees of fineness as are needed to accomplish the desired results efficiently. Finish with 65 µm (220 grit CAMI-grade or P220 FEPA-grade) silicon carbide paper or cloth, removing all marks that may have been made by other grades of paper used previously. Ensure the prepared copper strip is protected from oxidation prior to final preparation, such as by immersing the strip in wash solvent from which it can be withdrawn immediately for final preparation (polishing) or in which it can be stored for future use.

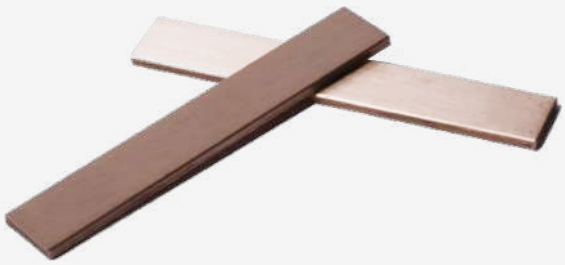

Figure 6

Manual Surface Preparation

As a practical manual procedure for surface preparation, place a sheet of silicon carbide paper or cloth on a flat surface and moisten it with kerosine or wash solvent. Rub the strip against the silicon carbide paper or cloth with a circular motion, protecting the strip from contact with the fingers by using ashless filter paper or wearing disposable gloves. Alternatively, the surface of the strip can be prepared by use of motor-driven machines using appropriate grades of dry paper or cloth.

Final Preparation

For strips prepared or new strips being used for the first time, remove a strip from its protected location, such as by removing it from the wash solvent. To prevent possible surface contamination during final preparation, do not allow fingers to come in direct contact with the copper strips, such as by wearing disposable gloves or holding the strips in the fingers protected with ashless filter paper. Polish first the ends and then the sides with the 105 µ m (120 grit to 150 grit CAMI-grade or P120 to P150 FEPA-grade) silicon carbide grains picked up with a pad of cotton (cotton wool) moistened with wash solvent. Wipe vigorously with fresh pads of cotton (cotton wool) and subsequently handle without touching the surface of the strip with the fingers. Forceps have been found suitable to use.

ASTM D130 TEST PROCEDURE

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OPERATING INSTRUCTIONS

Final Steps

Clamp in a vise and polish the main surfaces with silicon-carbide grains on absorbent cotton. Do not polish in a circular motion. Rub in the direction of the long axis of the strip, carrying the stroke beyond the end of the strip before reversing the direction. Clean all metal dust from the strip by rubbing vigorously with clean pads of absorbent cotton until a fresh pad remains unsoiled. When the strip is clean, immediately immerse it in the prepared sample.

PROCEDURE

Procedure Overview

There are a variety of test conditions, which are broadly specific to given classes of product but, within certain classes, more than one set of test conditions of time or temperature, or both, may apply. In general, aviation gasoline and aviation turbine fuel shall be tested in a pressure vessel at 100 °C and other high vapor pressure fuels, like natural gasoline, at 40 °C. Other liquid products shall be tested in a test tube at 50 °C, 100 °C or even higher temperatures.

The conditions of time and temperature given below are commonly used and are quoted in the ASTM specifications for these products where such specifications exist. They are, however, guides only. Other conditions can also be used when required by specifications or by agreement between parties. The test conditions of time and temperature shall be recorded as part of the result.

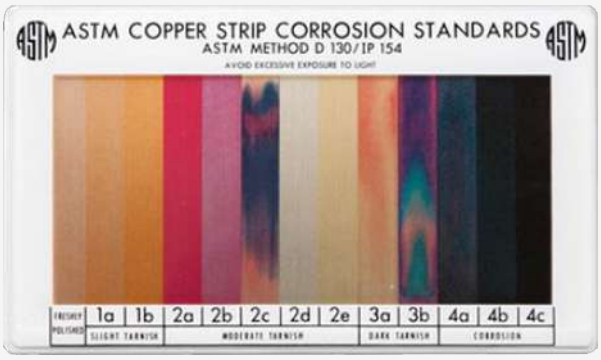

Figure 7

ASTM D130 TEST PROCEDURE

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PROCEDURE

Pressure Vessel Procedure

For use with aviation gasoline, aviation turbine fuel, and higher vapor pressure samples.

- For Aviation Gasoline and Aviation Turbine Fuel

  Place 30 mL of sample, completely clear and free of any suspended or entrained water into a chemically clean and dry 25 mm by 150 mm test tube. Within 1 min after completing the final preparation (polishing), slide the copper strip into the sample tube. Place the sample tube into the pressure vessel and screw the lid on tightly. If more than one sample is to be analyzed at essentially the same time, it is permissible to prepare each pressure vessel in the batch before completely immersing each pressure vessel in the liquid bath at 100 °C ± 1 °C (212 °F ± 2 °F), provided the elapsed time between the first and last samples is kept to a minimum. After 2 h ± 5 min in the bath, withdraw the pressure vessel and immerse for a few minutes in cool water (tap water). Open the pressure vessel, withdraw the test tube, and examine the strip.

- For Natural Gasoline

  Carry out the test exactly as described for aviation gasoline but at 40 °C (104 °F) and for 3 h ± 5 min.

Test Tube Procedure

For use with most liquid products.

- For Diesel Fuel, Fuel Oil, Automotive Gasoline

  Place 30 mL of sample, completely clear and free of any suspended or entrained water, into a chemically clean, dry 25 mm by 150 mm test tube and, within 1 min after completing the final preparation (polishing), slide the copper strip into the sample tube. If more than one sample is to be analyzed at essentially the same time, it is permissible to prepare each sample in the batch by stoppering each tube with a vented stopper, such as a vented cork, before placing each tube in a bath maintained at 50 °C ± 1 °C (122 °F ± 2 °F), provided the elapsed time between the first and last sample prepared is kept to a minimum. Protect the contents of the test tube from strong light during the test. After 3 h ± 5 min in the bath, examine the strip.

- For Tests on Fuel Oil and Diesel Fuel

  For specifications other than Specifications D396 and D975, a temperature of 100 °C (212 °F) for 3 h is often used as an alternative set of conditions.

- For Automotive Gasoline

  Some automotive gasolines with vapor pressure above 80 kPa at 37.8 °C have exhibited evaporation losses in excess of 10 % of their volume. If such evaporation losses are apparent, it is recommended that the Pressure Vessel Procedure be used. In addition, if the lab decides it wants to minimize or mitigate any evaporation losses associated with the analysis of automotive gasolines (even if the corresponding vapor pressure is ≤ 80 kPa), the option exists for the lab to test samples using the Pressure Vessel Procedure.

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Vero Scientific

As Vero Scientific, we provide advanced measurement technologies, preventive maintenance solutions, and cloud-based analytics for oil and fuel analysis. Our mission is to empower industries with precise, reliable, and sustainable solutions.