



# user guide



**CME4**  
concrete encounter



## TABLE OF CONTENTS

Introduction.....	2
How it works.....	3-4
Instrument Features.....	5
Working With your CME4.....	6
• A note on 'Drying time for concrete floors and screeds'.....	6
• Pre-test conditioning and preparation.....	7
• Operating Instructions.....	8-10
Complementary Tramex Instruments.....	11
Limitations.....	12
Calibration.....	12
Warranty.....	13
Warranty Claims .....	14
Product Development.....	15
Safety.....	15

## INTRODUCTION

Thank you for selecting the CME4 Concrete Encounter from Tramex.

The Tramex CME4 is a non-invasive handheld electronic instrument used for accurate, instant and non-destructive testing of Moisture Content in concrete and cementitious slabs and screeds, giving Carbide Method equivalent readings for both concrete and Anhydrite. It has been designed for the Flooring, Water Damage Restoration, Inspection/Surveying and Indoor Air Quality industries.

To get the maximum benefit from the Tramex CME4, it is suggested that you read this manual to familiarize yourself with the instrument and its capabilities, before undertaking any flooring tests.

### **Why should a test be done?**

New floor slabs and screeds that are insufficiently dry before flooring is posed, and high moisture content in existing floor substrates can cause a host of costly flooring system failures. Testing allows for confidence in a job well done that meets manufacturer's recommendations, official standards and customer satisfaction.

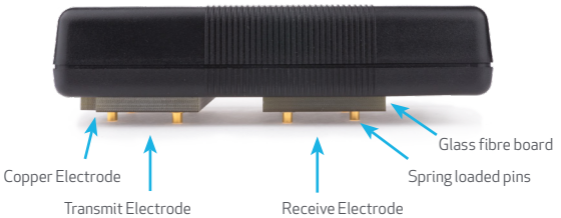
### **When should a test be done ?**

New floor slabs and screeds should be tested regularly during the drying period, to help evaluate and control the drying process, and ensure that the substrate has reached sufficient dryness before the floor covering is installed. For the purpose of restoration, testing can be done on existing screeds to evaluate the extent and source of water damage, as well as controlling the drying process

## HOW IT WORKS

The CME4 detects and evaluates the moisture conditions within the cementitious slab or screed by non-destructively measuring the electrical impedance, which varies in proportion to the moisture content in the material under test. The electrical impedance is measured by creating a low frequency alternating electric field between the parallel co-planer electrodes as illustrated in the diagram below.

Concrete Encounter CME4



This field penetrates the material under test. A very small alternating current flows through the field. The CME4 detects this current, determines its amplitude and converts it to a moisture content value. By simply pressing the CME4 down on the surface in strategically chosen locations, instant readings can be taken over a large area.

Instrument pressed on to material surface to measure/detect moisture



Alternating Electric Field

## INSTRUMENT FEATURES

The instrument face with brief notes on the push button controls and LED indicators is shown below.



- 1 = Moving coil meter.
- 2 = Hold - flashing LED.
- 3 = Power ON LED.
- 4 = Power ON/OFF button.
- 5 = Hold button.

## WORKING WITH THE CME4

### A note on 'Drying time for concrete floors and screeds'

Concrete floors and screeds must be allowed to dry to an adequate level before the installation of floor coverings or application of coatings. Manufacturers of such systems generally require moisture testing to be performed before installation or use on a floor slab.

Excessive moisture in a floor slab after the installation of a floor covering or coating can cause failures such as condensation, blistering, delaminating, movement and general deterioration of the finished flooring/coating. There is also a risk of promoting microbial growth.

No exact period can be specified for the drying of such floors as this is affected by temperature and humidity within the building as well as concrete curing times and other factors. Typically a period of at least 3 to 4 weeks per 25mm (1 inch) depth of concrete or sand/cement screed needs to be allowed. Longer periods may be required in areas of high humidity or low temperature. During the drying period and prior to applying the floor covering, the floor should be regularly checked to monitor moisture content with the CME4.

## Pre-test conditioning and preparation

For best and most accurate results, to allow for an accurate reflection of the amount of moisture present and moisture movement in the slab during normal operating conditions:

- Artificial heating or drying equipment should be turned off at least 96 hours before final readings are taken.
- Internal conditions of the building should have been at normal service temperature and humidity for at least 48 hours.

Prior to testing, the surface should be prepared:

- The test area should be clean and free of any foreign substances.
- All covering materials, adhesive residue, curing compound, sealers, paints, etc., should be removed to expose a test area of clean bare concrete, strictly observing all the appropriate safety and health practices.
- Removal of covering materials and cleaning if required should take place a minimum of 48 hours prior to testing.
- Use of water based cleaning methods that could lead to elevated surface and/or sub-surface moisture levels in the floor slab are not recommended.



## Operating Instructions

1. Power on by pressing ON/OFF button. The lower LED will light up and remain on.

### NOTE

If the battery voltage is getting low, the two LEDs will flash sequentially for a short period. The instrument will continue to operate for some time but it is recommended that the PP3 (9 volt) battery be replaced as soon as convenient.

2. Press the CME4 directly onto the surface of the material being tested, having removed any dust or foreign matter from both the CME4 electrodes and the floor slab. Ensure that all of the electrode spring-loaded pins are fully compressed.
3. Reading the CME4 analog dial:
  - For a moisture content reading on a concrete surface take a reading from the top, 0% to 6%, red line of the analog meter dial.
  - For a Carbide Method (CM) equivalent reading on an anhydrite surface take a reading from the middle, 0-1.9, blue line of the analog meter dial.
  - For a Carbide Method (CM) equivalent reading on a concrete surface take a reading from the lower, 0-4, yellow line of the analog meter dial.

4. The HOLD function is especially useful when taking readings in areas where it is difficult to see the analog dial while it is being pressed onto the surface.
  - Press the HOLD button once for easy and accurate readings. The needle freezes on the analog dial. The upper LED light flashes slowly indicating HOLD is on.
  - If the CME4 is powered off while on HOLD, the frozen reading is digitally memorized and restored when powered on again.
  - Press the Hold button again to remove the frozen reading in order to take further readings.
5. Recommendations.
  - Take a number of tests (3-4) in close proximity to each other, as the distribution of moisture tends to become erratic as concrete dries out. Use only the highest reading.
  - Avoid testing in locations subject to direct sunlight or sources of heat.
  - Include tests in potentially damp areas such as the center of the slab and within 3 feet (1 meter) of the walls.
  - Always refer to the adhesive and/or floor covering manufacturer's recommendations for the acceptable moisture content levels of concrete or floor screeds.

**NOTE**

The CME4 is calibrated to give percentage moisture content readings on a clean, bare dust free concrete floor slab, therefore readings taken on concrete slabs through paint, coating, adhesives or other materials on the surface of the slab should be regarded as qualitative or comparative and not quantitative.

6. Power down by pressing ON/OFF. The lower LED light will go off.

**NOTE**

To conserve battery life, the CME4 automatically powers OFF after 10 minutes of inactivity.

## COMPLEMENTARY TRAMEX INSTRUMENTS:

The following instruments from Tramex may be complementary.

- The Tramex MEP is a handheld analog instrument incorporating three ranges of sensitivity for non-destructive testing and measurement of moisture in materials such as wood, plaster, brick, tiles, resilient flooring, laminates and roofing.
- The Tramex MRH3 is a handheld digital instrument incorporating five ranges of sensitivity for non-destructive testing and measurement of moisture in materials such as wood, plaster, brick, tiles, resilient flooring, laminates and roofing. In addition it incorporates optional plug-in relative humidity probes and heavy-duty pin-type probes.
- The Hygrohood is a robust surface humidity box tester for concrete and screeds and can be used in conjunction with the CME4 to corroborate the non-destructive moisture content test and to conform to industry standards.
- The Digital Hygrometer AZ 8703 is a pocket-sized hygrometer providing fast and accurate measurement of relative humidity, temperature and dew-point of the environment.

- The Tramex Infrared Surface Thermometer is a handheld thermometer featuring a laser target pointer to gain accurate temperature readings of the floor slab, and almost any other surface from a distance.

## LIMITATIONS

The CME4 will not detect or measure moisture through any electrically conductive materials including metal sheeting or cladding, many types of black EPDM rubber or wet surfaces. The CME4 is not suited for taking comparative readings in the concrete substrate through thick floor coverings such as wood.

## CALIBRATION

For regular on-site assessment of your CME4 in moisture measurement mode, a calibration-check plate is available from the suppliers of your CME4. Should it be found that readings are outside the set tolerances, it is recommended that the CME4 be returned for re-calibration. Calibration adjustments should not be carried out by anyone other than Tramex or their authorized service provider who will issue a calibration certificate on completion.

Requirements for quality management and validation procedures, such as ISO 9001, have increased the need for regulation and verification of measuring and test instruments. It is therefore recommended that calibration of the CME4 should be checked and certified in accordance with the standards and/or protocols laid down by your industry (usually on an annual basis) by an authorized test provider. The name of your nearest test provider and estimate of cost is available on request.

## **WARRANTY**

Tramex warrants that this instrument will be free from defects and faulty workmanship for a period of one year from date of first purchase. If a fault develops during the warranty period, Tramex will, at its absolute discretion, either repair the defective product without charge for the parts and labor, or will provide a replacement in exchange for the defective product returned to Tramex Ltd. This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care.

In no event shall Tramex, its agents or distributors be liable to the customer or any other person, company or organization for any special, indirect, or consequential loss or damage of any type whatsoever (including, without limitation, loss of business, revenue, profits, data, savings or goodwill), whether occasioned by the act, breach, omission, default, or negligence of Tramex Ltd., whether or not foreseeable, arising howsoever out of or in connection with the sale of this product including arising out of breach of contract, tort, misrepresentation or arising from statute or indemnity. Without prejudice to the above, all other warranties, representations and conditions whether made orally or implied by circumstances, custom, contract, equity, statute or common law are hereby excluded, including all terms implied by Section 13, 14 and 15 of the Sale of Goods Act 1893 and Sales of Goods and Supply of Services Act 1980.

## **WARRANTY CLAIMS**

The Warranty card should be completed and returned to Tramex Ltd, Ireland. A defective product should be returned shipping pre paid, with full description of defect.

## PRODUCT DEVELOPMENT

It is the policy of Tramex to continually improve and update all its products. We therefore reserve the right to alter the specification or design of this instrument without prior notice.

## SAFETY

This Users Guide does not purport to address the safety concerns, if any, associated with this instrument or its use. It is the responsibility of the user of this instrument to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.



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