



CGM CIGIEMME S.p.A.

Controlli Non Distruttivi - Non Destructive Testing



PORTABLE OPTICAL REFRACTOMETER



DESCRIPTION

Portable refractometer for routine production testings in various industrial sectors. Equipped with a single scale and automatic temperature compensation (ATC); suitable for lubricants and emulsified oils. Measuring range: 0.0÷32% Brix; resolution: 0.2% Brix; accuracy: $\pm 0.2\%$ Brix. All models are supplied ready to use in a padded case.

The portable optical refractometer is used in non-destructive testing (NDT) to measure the concentration of liquids, particularly in fluorescent liquid penetrant testing. The concentration of the emulsifier, which removes penetrant excess, is critical for effective inspection, and this instrument provides a quick and reliable way to verify it. This test is used to:

- **Ensure proper removal:** an emulsifier too weak will not effectively remove the penetrant from the surface, potentially hiding some defects.
- **Prevent excessive washing:** an emulsifier too concentrated could remove the penetrant from a crack, preventing its detection.
- **Provide quick results:** a portable refractometer allows immediate on-site measurement, which is much faster than sending a sample to a laboratory.
- **Helping to maintain quality:** by regularly checking the emulsifier concentration, technicians can ensure that the process complies with reference standards, such as ASTM.



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USER INSTRUCTIONS

STEP-BY-STEP DESCRIPTION

1. Preparation and calibration

- **Cleaning the prism:** clean the glass prism and hinged cover plate with a soft, lint-free cloth and distilled water. Ensure that the prism is completely dry.
- **Calibration with distilled water:** pour a few drops of distilled water onto the prism and close the lid.
- **Setting to zero:** look through the ocular lens towards a light source. Focus the ocular lens until the scale is clear. The boundary line between the blue and white fields should align with the zero mark.
- **Perform calibration:** if the line is not at zero, use the small screwdriver to turn the calibration screw until the line is perfectly aligned.
- **Drying:** clean and dry the prism again before testing the sample.

2. Testing the emulsifier sample

- **Sample collection:** use a pipette to apply one or two drops of emulsifying solution to the clean prism. Do not immerse the refractometer directly in the tank, as this could damage it.
- **Let it acclimatise:** close the lid and wait approximately 30 seconds for the sample to reach the instrument's temperature. The refractometer is equipped with automatic temperature compensation (ATC).
- **Reading the scale:** hold the instrument towards a light source and look through the lens. Read the value at the point where the boundary line between light and dark intersects the scale.
- **Reading the correct scale:** ensure to read the correct scale for the present application. It is necessary to create a diagram that relates the known emulsifier concentration (e.g. 10% – 20% – 30%) to the refractometer reading; this allows to obtain the concentration value of the emulsifier solution in use.
- **Clean after use:** after the reading, clean the prism with water and a soft cloth to prevent accumulation and corrosion.

AVAILABLE MODELS

PART NUMBER	DESCRIPTION	REF.
04099817	Portable Optical Refractometer – Model 101 ATC	98.17



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