

PARTICLE CHARGE TESTER

BE 103

A Particle Charge Tester (also known as a Particle Charge Meter) is a specialized laboratory instrument primarily used in materials testing, especially for identifying the electrical charge of particles in bituminous emulsions (like asphalt or bitumen used in road construction). It determines whether the emulsion is cationic (positively charged) or anionic (negatively charged) by measuring the migration of charged particles toward electrodes under an applied electric field. This helps ensure compatibility in paving and sealing applications.

FOOLOWING STANDARD

ASTM D244

HOW IT WORKS

- **Basic Principle:** A small sample of the emulsion is placed between two electrodes. A DC voltage (typically 0-10V) is applied, causing charged particles to move and generate a measurable current (via a milliammeter). Positive deflection indicates cationic charge; negative indicates anionic.
- **Key Components** (from standard models like ASTM D244-compliant testers):
 - Millimeter (0-10 mA scale).
 - Variable resistor for voltage control.
 - Electrode assembly (often glass or plastic cells).
 - Support base for stability.
- **Test Procedure** (simplified):
 1. Prepare a diluted emulsion sample.
 2. Insert into the test cell.
 3. Apply voltage and observe deflection.
 4. Record results (e.g., >0.1 mA for cationic).

Applications

- **Road Construction:** Essential for quality control of emulsified asphalts.
- **Other Uses:** Advanced models (Particle Charge Analyzers) extend to water/wastewater treatment for optimizing coagulant dosing by measuring colloidal particle charge.

