

# **BASIC COMPOSITION INDICATORS - CARBON RESIDUE & ASH CONTENT TESTING**



# Basic Composition Indicators - Carbon Residue & Ash Content Testing

Carbon residue and ash content are two fundamental composition indicators that characterize the non-volatile and inorganic fractions of petroleum products. These parameters provide critical insights into fuel cleanliness, combustion behavior, engine deposit tendency, and lubricant quality, making them essential measurements across refinery quality control, fuel specification compliance, and lubricant development programs.

Carbon residue — whether measured by the Ramsbottom or Micro Carbon Residue (MCR) method — quantifies the amount of carbonaceous residue remaining after evaporation and pyrolysis of a petroleum product. Ash content measures the inorganic mineral residue left after complete combustion. Torontech offers dedicated instruments for all three measurements, covering the standard test methods specified by ASTM and international standards organizations.

## APPLICATIONS

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### Application

Carbon residue and ash content determination serve important functions across a wide range of petroleum products:

- Diesel and residual fuels: Carbon residue is a key indicator of injector fouling tendency and combustion chamber deposit formation.
- Lubricating oils and base stocks: Carbon residue values help predict oil burning and piston deposit behavior in internal combustion engines.
- Crude oil evaluation: Carbon residue (MCR or Conradson) of crude oil residues is used in refinery planning and coker feed assessment.
- Transformer and insulating oils: Low carbon residue and ash content confirm the absence of oxidation byproducts and metallic contaminants.
- Biodiesel: Ash content testing verifies the absence of residual catalyst metals in biodiesel (ASTM D6751, EN 14214).

- Heavy fuel oils: Ash content is measured to assess the potential for high-temperature corrosion and deposit formation in combustion equipment.

## FEATURES

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### Why Choose Torontech's Series for Your Basic Composition Indicator Testing?

Torontech provides a complete set of carbon residue and ash content testing instruments, each optimized for its respective standard method:

- Ramsbottom Carbon Residue: Torontech's electric furnace Ramsbottom apparatus provides precise temperature control for accurate carbon residue determination per ASTM D524, a widely specified test for fuels and lubricants.
- Micro Carbon Residue (MCR): The MCR apparatus delivers rapid carbon residue measurement with a small sample volume, aligned with ASTM D4530 / ISO 10370, and is increasingly the preferred method over the classical Conradson test.
- Ash Content Testing: Designed for gravimetric ash determination in petroleum products per ASTM D482, enabling reliable quantification of inorganic mineral content.
- Precision Temperature Management: All Torontech composition indicator instruments feature controlled heating profiles that are critical to achieving accurate, reproducible carbon residue and ash content values.
- Comprehensive Method Coverage: Together, Torontech's three instruments cover all major standard methods for basic composition indicators required by modern petroleum laboratories.



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