

Advice Sheet 36: Incinerator Bottom Ash (IBA) Analysis

Introduction

Incinerator Bottom Ash (IBA) is the residue remaining in an incinerator after burning waste. In addition to ash and clinker combustion products it contains glass, ceramic, metal, stones and aggregates. After removal from the incinerator the material needs to be characterised to assess if it is classed as hazardous or non-hazardous waste.

Guidelines have been set out on how and when to sample for classification purposes.

Sample Preparation

NRM provide an analysis service which includes preparation following the ESA Protocol guidelines. This involves mixing 40kg of material and selecting 20kg to prepare. Any material which is not possible to grind is removed and the weight recorded. This is split into inert (*e.g.* paper and fabric) and metal (ferrous and non-ferrous). This is reported as inert non-grindable removed (% w/w on as-received basis).

Metal components removed from representative sub-samples (% w/w on as-received basis) and any dangerous substances found are also reported.

Samples are dried at 105°C and finely ground (<300µm) to produce a suitable sample for analysis. For samples requiring dioxins and furans, this is determined on the semi-prepared 'fresh' sample at a sub-contracted laboratory. The report displays the ITEQ and WHO 2005 lower bound and upper bound toxic equivalents as calculated from the Toxic Equivalent Factors for Humans and Mammals.

Analytical Methods

Accreditation to ISO 17025 is held for the preparation following the ESA Protocol and analysis of copper, nickel, lead and zinc on an aqua regia digest. The analysis is carried out on 11 replicates for these key metals.

Analysis for pH and Alkali Reserve are also carried out to provide values for the key parameters used to determine if the ash material is classed as hazardous waste.

Further metals can be added to the analysis, together with LOI at 550°C, TOC analysis, Total Nitrogen and Total Carbon if required.

Our Service

We offer the following standard analysis packages which are compliant with the ESA Protocol. Sample containers and a courier service are provided. Results will be sent via a pdf e-mail within the turnaround time.

Analysis Package	Includes:	Turnaround time	Price
E063 - ESA Protocol preparation and basic assessment	Including weight received, non-grindables removed, moisture content, pH, alkali reserve, TOC, LOI at 550, 11 replicates of key metals [Cu,Ni,Pb,Zn], single analysis of 26 other elements (aluminium, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, iron, lithium, magnesium, manganese, mercury, molybdenum, phosphorus, potassium, selenium, silver, sodium, strontium, thallium, tin, titanium and vanadium) and hexavalent chromium.	7 - 10 days	£945
E064 - Composition testing of IBA	Preparation as ESA Protocol including non-grindables removed, moisture content, pH, alkali reserve, 11 replicates of Cu, Ni, Pb, Zn, single analysis of other metals (aluminium, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, iron, lithium, magnesium, manganese, mercury, molybdenum, phosphorus, potassium, selenium, silver, sodium, strontium, thallium, tin, titanium and vanadium), Cr[VI], EPH [C10-C40], dioxins, furans, dioxin-like PCBs, LOI at 550, TOC, total cyanide.	10 days	£1420

We also offer comprehensive WAC leachate testing of IBA including additional characterisation parameters.

Similar analysis can be carried out on Air Pollution Control residues, although this will not be accredited.

Contact

For technical queries please contact Dr Sarah Pitcher

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To arrange delivery of appropriate sample containers and to book a courier please contact Customer Services:

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Reference

Environmental Services Association (ESA) document 'Sampling and Testing Protocol to assess the status of IBA' August 2014

Guidance on the classification and assessment of waste (1st edition 2015) Technical Guidance WM3