



Standard Test Method for Carbon and Hydrogen in the Analysis Sample of Refuse-Derived Fuel¹

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1. Scope

1.1 This test method covers the determination of total carbon and hydrogen in a sample of refuse-derived fuel (RDF). Both carbon and hydrogen are determined in one operation. This test method yields the total percentages of carbon and hydrogen in RDF as analyzed and the results include not only the carbon and hydrogen in the organic matter, but also the carbon present in mineral carbonates and the hydrogen present in the free moisture accompanying the analysis sample as well as hydrogen present as water of hydration.

NOTE 1—It is recognized that certain technical applications of the data derived from this test procedure may justify additional corrections. These corrections could involve compensation for the carbon present as carbonates, the hydrogen of free moisture accompanying the analysis sample, and the calculated hydrogen present as water of hydration.

1.2 This test method may be applicable to any waste material from which a laboratory analysis sample can be prepared.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific precautionary statements see Section 8.

2. Referenced Documents

2.1 *ASTM Standards:*²

D1193 Specification for Reagent Water

D5681 Terminology for Waste and Waste Management

¹ This test method is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of Subcommittee D34.03 on Treatment, Recovery and Reuse.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

E180 Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals (Withdrawn 2009)³

E790 Test Method for Residual Moisture in a Refuse-Derived Fuel Analysis Sample

E791 Test Method for Calculating Refuse-Derived Fuel Analysis Data from As-Determined to Different Bases

E829 Practice for Preparing Refuse-Derived Fuel (RDF) Laboratory Samples for Analysis (Withdrawn 2002)³

3. Terminology

3.1 For definition of terms used in this test method, refer to Terminology D5681.

4. Summary of Test Method

4.1 The determination is made by burning the sample to convert all of the carbon to carbon dioxide and all of the hydrogen to water. The combustion is carried out by high purity oxygen that has been passed through a purifying train. The carbon dioxide and water are recovered in an absorption train. The combustion tube packing is used to remove any interfering substances. This test method gives the total percentages of carbon and hydrogen in the RDF as analyzed, including the carbon in carbonates and the hydrogen in any form of water.

5. Significance and Use

5.1 The standard sample is available to producers and users of RDF as a method of determining the weight percent of carbon and hydrogen in the analysis sample.

5.2 Carbon and hydrogen are part of the ultimate analysis of a fuel and can be used for calculations of combustion parameters.

6. Apparatus

6.1 *Oxygen-Purifying Train*—The high-purity oxygen is passed through water and carbon dioxide absorbers prior to use for combustion. The oxygen-purifying train consists of the following three units in order of passage of oxygen (see Fig. 1):

³ The last approved version of this historical standard is referenced on www.astm.org.