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~~Coal — Froth flotation testing —~~

~~Part 2:
Sequential evaluation~~

~~Houille — Essais de flottation —~~

~~Partie 2: Évaluation séquentielle~~

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

~~International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.~~

~~The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.~~

~~Attention is drawn~~The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that ~~some of the elements~~implementation of this document may ~~involve~~ the ~~subject~~use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of ~~any claimed~~ patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8858-2~~Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.~~

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 27, *Coal and Coke*, Subcommittee SC 1, *Coal preparation: Terminology and performance*.

This second ~~draft edition cancels and~~ replaces the first ~~draft edition (ISO 8858-2 2004 and is), of which it constitutes~~ a minor revision. The changes are as follows:

~~Changes include update~~— updated title;

— document updated according to current ISO drafting rules.

A list of ~~name of Standard~~all parts in line with renaming Standards either Coal or Coke.

the ISO 8858 consists of the following parts, ~~underseries can be found on~~ the general title *Hard coal — Froth flotation testing*:ISO website.

— *Part 1: Laboratory procedure*

— *Part 2: Sequential evaluation*

— *Part 3: Release evaluation*

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The froth flotation of coal has a widespread application for the recovery of fine coal particles and their separation from unwanted mineral matter. The response of coal to the froth flotation process is measured initially by a laboratory scale test. ISO 8858-1:1990 provides a means of evaluating the general flotation characteristics of a coal under a set of specified conditions and will not necessarily indicate the full potential of that coal. It is accepted that variation of the many parameters in the froth flotation process can be used to effect the beneficiation of the product. This [part of ISO 8858 document](#) describes a procedure for the more complete determination of the flotation characteristics of a coal, using the apparatus and basic procedures described in ISO 8858-1. The purpose of this extended procedure is to provide information similar to that provided by the sink/float curve, which is the basis for density separations. The data obtained are expressed as a yield/ash curve. The information can be used to define the limitations on the cleaning of fine coal by froth flotation.

The procedures specified in this [part of ISO 8858 document](#) are of practical significance in the development and evaluation of coal-preparation-plant flotation circuits, although engineering design aspects, such as flotation kinetics and the selection of size and type of cell, are not addressed.

The flotation response curve (yield/ash) indicates the maximum possible yield at any specified ash content. The general shape of the curve indicates the sensitivity of flotation performance to the nature of the coal and to operating conditions.

The procedure may be modified to test and compare the performance of different frother and collector types, the assessment of liberation by grinding, and the comparison of alternative feed size ranges. However, results of such tests should clearly indicate any use of non-standard procedures.

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Coal — Froth flotation testing —

Part 2: Sequential evaluation

1 Scope

~~Part 2:~~ ~~Sequential evaluation~~

~~1—Scope~~

This ~~part of ISO 8858~~ document sets out a laboratory sequential procedure for the froth flotation testing of fine coal, e.g. coal having a particle size of less than 0,5 mm. The procedure provides a means of evaluating ~~for a coal~~ the flotation characteristics for coal (expressed as a yield/ash relationship) that ~~may can~~ be expected from the froth flotation process.

~~Pulp~~ This document does not apply to pulp samples that cannot be dewatered without the use of heat or chemical additives ~~are not covered by this part of ISO 8858; nor does it cover.~~ This document does not apply to procedures for the investigation of flotation kinetics.

The test is not intended to provide plant design data.

This ~~part of ISO 8858 should~~ document is intended to be read in conjunction with ISO 8858--1.

2 Normative references

[ISO/FDIS 8858-2](https://standards.iteh.ai/catalog/standards/iso/5756bff7-96e0-499d-b129-6d989d01a874/iso-fdis-8858-2)

<https://standards.iteh.ai/catalog/standards/iso/5756bff7-96e0-499d-b129-6d989d01a874/iso-fdis-8858-2>

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 589:~~2008~~, *Hard coal*— *Determination of total moisture*

ISO 1171:~~2010~~, *Solid mineral fuels*— *Determination of ash*

ISO 1213--1:~~2020~~, *Solid mineral fuels*— *Coal and coke* — *Vocabulary*— *Part-1: Terms relating to coal preparation*

ISO 1953:~~2015~~, *Coal, Hard coal* — *Size analysis by sieving*

~~ISO 7936:2022, Hard coal—Determination and presentation of float and sink characteristics—General directions for apparatus and procedures~~

ISO 8858--1:~~1990~~, *Hard coal* — *Froth flotation testing* — *Part 1: Laboratory procedure*

~~ISO 13909-2: 2016, Coal and coke—Mechanical sampling—Part 2: Coal—Sampling from moving streams~~

~~ISO 13909-4:2016, Coal and coke — Mechanical sampling — Part 4: Coal — Preparation of test samples~~

~~ISO 18283:2020, Coal and coke — Manual sampling~~

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1213-1 ~~and the following 1~~ apply.

3.1

higher rank coal

~~coal having a gross specific energy of 21,00 MJ/kg or greater on an ash-free, moist (afm) basis and 27,00 MJ/kg or greater on a dry, ash-free (daf) basis~~ ISO and IEC maintain terminology databases for use in standardization at the following addresses:

~~— ISO Online browsing platform: available at <https://www.iso.org/obp>~~

~~— IEC Electropedia: available at <https://www.electropedia.org/>~~

4 Principle

A sequence of laboratory flotation tests is carried out on a single coal sample, using a procedure based on that described in ISO 8858-1. Variations on that procedure are made to generate a number of products, by refloating concentrates and tailings a number of times. The masses and ash mass fractions of the various products are used to construct a yield/ash curve showing the flotation response.

5 Sample

The history and method of sampling and preparation of samples can affect the flotation characteristics of the coal considerably. The history of the sample should be recorded, and care should be taken to ensure that samples for comparison purposes are sampled and prepared in a similar manner and, where applicable, in accordance with the sampling and preparation procedures specified in ISO 13909-2, ~~ISO 13909~~ ISO 13909-4 and ISO 18283.

A size analysis of the sample shall be carried out in accordance with ISO 1953.

6 Apparatus

The apparatus shall be as specified in ISO 8858-1.

7 Flotation conditions

7.1 Collector dosage

To establish well-defined flotation response curves, it is necessary to extend the range of conditions specified in ISO 8858-1. Different coals will require different conditions to display the attainable range of yields and corresponding product ash levels. To obtain a preliminary guide to the appropriate flotation conditions for this extended test, it is recommended that a sample of the coal be first tested according to the procedure specified in ISO 8858-1.