

Sampling and Analysis

Experience with the Latest
ISO Standards

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Sampling Standards

Hard coal & Coke

ISO 1988-1975 : General sampling / Preparation /
Bias testing

ISO 13909-2001: Mechanical sampling / Preparation/
Bias testing

ISO 18283-2005: Manual sampling - stationary/
moving streams / Preparation /
Precision test

ISO - 1988

Minimum number of Increments

<u>CONDITION OF COAL</u>	<u>CONVEYORS AND FALLING STREAMS</u>	<u>TRUCKS TUBS AND BUCKET CONVEYORS</u>	<u>STOCKPILES AND SHIPS(HOLDS)</u>
CLEANED	16	24	32
UNCLEANED	32	48	64

ISO 13909

MINIMUM NUMBER OF INCREMENTS

$$n = 4V_1 / (mP_L^2 - V_{PT})$$

Where:

V₁ is the primary increment variance.

m is the number of sub-lots in the lot.

P_L is the overall precision of sampling, preparation and testing.

V_{PT} is the preparation and testing variance.

MINIMUM INCREMENT MASSES

<u>COAL TOP</u> <u>SIZE(mm)</u>	<u>ISO 1988</u> <u>MIN MASS Kg</u>	<u>ISO18283</u> <u>MIN MASS Kg</u>
150	14.1	9.0
100	6.0	6.0
75	4.5	4.5
50	3.0	3.0
30	2.0	2.0
20	1.2	1.2
6.3	0.6	0.5

ISO 1988 min increment mass(kg) = 0.06 x top size

ISO 13909

Minimum Increment Mass

$$m_i = m_s / n$$

Where :

m_i is the minimum primary increment mass

m_s is the minimum sample mass (for top size)

n is the minimum number of increments taken from the sub-lot

MINIMUM SAMPLE MASS **FOR GENERAL ANALYSIS AND TOTAL** **MOISTURE**

<u>TOP SIZE mm</u>	<u>ISO 13909</u> <u>kg</u>	<u>ISO 18283</u> <u>kg</u>	<u>ISO 1988</u> <u>kg</u>
150	2600	2600	450
100	950	950	192
75	470	470	144
50	170	170	96
30	50	50	64
20	27	27	38
6.3	5	5	19

Basic sampling principles

- a) Implement/cutter openings – minimum of 3 times nominal top size.
- b) Implement /cutter must not overflow when taking the increment.
- c) Cutter velocities must be less than 0.6M/sec (except for cross belt (Hammer) cutters).
- d) All particles must have an equal chance of being included in the sample.
- e) Take as many increments as practically possible to improve sampling precision.