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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R 728

SIZE ANALYSIS OF COKE

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BRIEF HISTORY

The ISO Recommendation R 728, *Size analysis of coke*, was drawn up by Technical Committee ISO/TC 27, *Solid mineral fuels*, the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question by the Technical Committee led, in 1963, to the adoption of a Draft ISO Recommendation.

In March 1964, this Draft ISO Recommendation (No. 683) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Germany	South Africa,
Austria	India	Rep. of
Belgium	Italy	Switzerland
Canada	Korea, Rep. of	Turkey
Chile	Netherlands	U.A.R.
Colombia	New Zealand	United Kingdom
Czechoslovakia	Poland	U.S.A.
Denmark	Romania	U.S.S.R.

One Member Body opposed the approval of the Draft :

France

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council which decided, in May 1968, to accept it as an ISO RECOMMENDATION.

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SIZE ANALYSIS OF COKE

1. SCOPE

This ISO Recommendation describes the method of determining the particle size distribution of a sample of coke greater than 20 mm top size.

2. PRINCIPLE

The sample of coke is subjected to a process of size analysis by a specified procedure and the results expressed in terms of the cumulative percentages by mass of coke remaining on sieves of different sized apertures.

3. APPARATUS

3.1 Sieves

A series of sieves of perforated plate or wire mesh with round or square apertures of suitable sizes (see Notes 1 and 2, page 8).

3.2 Weighing machine

A weighing machine, preferably of the platform type, of suitable capacity and such that the weighing error does not exceed 0.1 % of the maximum mass of sample taken, or 100 g, whichever is the smaller.

4. SAMPLE

The sample should be representative of the coke under consideration and should not weigh less than 100 kg*. This mass may be reduced as indicated in Table 1 if the nominal upper size limit of the coke is 60 mm or below.

TABLE 1 — Minimum mass of sample for size analysis

Nominal upper size of coke (mm)	60	50	40	30
Minimum mass of sample (kg)	80	55	30	30

* The mass of sample is given here as a minimum only and does not preclude a greater mass being taken if desired (as in the example quoted in Table 1); this minimum mass is stated provisionally and may be amended when the recommended methods of sampling coke are available.

If the coke is excessively wet, the different size fractions will have different moisture contents; this will lead to variable errors in the determined masses of the various size fractions and hence in the calculated size analysis. Errors may also be caused by adhesion of small particles to larger ones. Accordingly, if the coke has a mean moisture content of more than 5 %, or is visibly wet, it should be dried to a mean moisture content not exceeding 5 % before sieving.

5. PROCEDURE

Select a set of sieves suitable for the purpose (see Notes 1 and 2, page 8) and, if possible, such that no size fraction will exceed about 25 % by mass of the sample; arrange the sieves in a stack in order of size of aperture with the smallest at the bottom.

Weigh the sample of coke, in several batches if necessary.

Place on the top sieve a quantity of the sample small enough to prevent choking and shake to allow most of the undersize to pass. Hand-place the coke remaining on the sieve (see Note 3, page 8) and transfer the oversize to a suitable container. Remove the top sieve and repeat these operations for sieves of aperture down to 40 mm round (1 1/2 in square).

Continue this procedure for sieves of aperture less than 40 mm round (1 1/2 in square), but using hand-shaking only (see Note 4, page 8), until the oversize on each sieve has been placed in a separate container. Mechanical sieving equipment may be used if it is proved to be free from bias (see Note 5, page 8).

If necessary, re-stack the sieves and repeat the procedure for successive quantities until the entire sample has been sized. At the end of each sieving operation, the oversize remaining on the sieve should not cover more than 75 % of the sieving area.

Either weigh separately each container with its size-fraction and subtract the tare masses, or, after weighing the fraction of largest size, add successively the other fractions and note the cumulative mass after each addition. The second method is preferable since it reduces the weighing error for the cumulative fractions.

6. CALCULATION AND REPORTING OF RESULTS

Record the mass of each size-fraction. Calculate the cumulative mass on each sieve starting with the sieve of largest aperture.

The apparent loss, i.e. the difference between the total mass of the sample before and after the size analysis, should be recorded. Loss in mass means loss of sample and should not occur. If the loss is not more than 1 % of the original sample mass, it should be added to the mass of the fraction of smallest size. If the loss is greater than 1 % of the original mass, the results of the size analysis should be rejected.

Convert each cumulative mass to a percentage of the total mass. An example is given in Table 2.

The type of sieve used (round or square hole) should also be recorded.

The results should be reported to the nearest 0.1 kg and 0.1 %.