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DETERMINATION OF CAKING POWER OF COAL BY THE ROGA METHOD

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For each individual country the only valid standard is the national standard of that country.

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BRIEF HISTORY

The ISO Recommendation R 335, *Determination of Caking Power of Coal by the Roga Method*, was drawn up by Technical Committee ISO/TC 27, *Solid Mineral Fuels*, the Secretariat of which is held by the British Standards Institution (B.S.I.).

Work on this question by the Technical Committee began in 1953 and led, in 1957, to the adoption of a Draft ISO Recommendation.

In May 1958, this Draft ISO Recommendation (No. 239) 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:

Austria	Greece	Poland
Belgium	India	Portugal
Burma	Italy	Romania
Canada	Japan	Spain
Czechoslovakia	Mexico	Turkey
Denmark	Netherlands	United Kingdom
Germany	New Zealand	U.S.S.R.
		Yugoslavia

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 August 1963, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 335 August 1963

DETERMINATION OF CAKING POWER OF COAL BY THE ROGA METHOD

1. INTRODUCTION

The purpose of the Roga test, which provides one of the parameters adopted for the "International Classification of Hard Coal by Type" of the United Nations Economic Commission for Europe, is to assess the caking power of a coal under standard conditions.

Although the Roga test and the Gray-King test both assess the caking properties of a coal, they do not measure precisely the same parameters and should not therefore be regarded as alternative methods.

2. PRINCIPLE

The caking power of a coal is defined by the mechanical strength of the crucible coke obtained by carbonization under standard conditions of an intimate mixture of 1 g of coal and 5 g of standard anthracite. The crucible coke obtained is then submitted to a drum test in a strictly prescribed manner and the Roga Index is calculated from the results.

3. APPARATUS

The balance should be sensitive to 0.01 g.

3.1 **Crucible.** A porcelain crucible having the following dimensions:

external diameter at the top	40 ± 1.5 mm
external diameter at the base	20 ± 1.5 mm
external height	40 ± 1.5 mm
wall thickness	less than 2 mm

3.2 **Lid.** A heat-resistant steel plate, 55 mm square, 1.5 to 2 mm thick, with a hole 2 mm in diameter in the centre.

3.3 **Stirrer,** made of wire, having an 8 mm loop at one end.

3.4 **Heat-resistant steel weight,** of 110 to 115 g, of the following dimensions: 31 mm in diameter and 21 mm in height, with a threaded hole in the centre 7 mm in diameter and 10 to 12 mm deep into which can be screwed a suitable rod for lifting the weight from the crucible.

3.5 **Press** for compressing the mixture of coal and standard anthracite under a weight with the mass of 6 kg (see Fig. 1, page 5).

3.6 **Electric furnace** with a zone of uniform temperature and a temperature control device capable of maintaining that zone at 850 ± 10 °C.

3.7 **Drum** with a cover, driving shaft, transmission gear and electric motor for carrying out the abrasion test on coke. The drum (see Fig. 2, page 6) has a 200 mm internal diameter, is 70 mm deep and is made of 2 mm thick sheet iron. To the inside walls, which should be perfectly finished, are welded two symmetrical sheet iron strips 70 mm long, 30 mm wide and 2 mm thick. To close the drum, the cover is seated on a felt or rubber gasket and is secured by 4 wing-nuts. The drum is fitted with a threaded stub axle which serves to couple it to the driving shaft. It is convenient to mount two drums on a single shaft to enable two tests on two different samples to be carried out simultaneously. The drum is rotated with the stub axle horizontal at 50 ± 2 revolutions per minute.

3.8 **Laboratory sieve,** made of thin brass sheet, with 1 mm round holes.

3.9 **Stopwatch.**

3.10 **Asbestos sheet.**

3.11 **Brush.**

4. REAGENTS

4.1 *Standard anthracite.* An anthracite of E.C.E. Code No. 100 A, having an ash content of less than 4 per cent on the dry basis and a volatile matter number of 5 to 6.5 per cent on the dry, ash-free basis (see Note below). The anthracite is carefully sieved before use on sieves of 0.3 mm and 0.4 mm apertures (square), the fraction passing the 0.4 mm sieve and remaining on the 0.3 mm sieve being retained for the test.

NOTE. - An anthracite of E.C.E. Code No. 100 A but having a different ash and volatile matter content may be used, provided it has been found by experiment to give the same results, within the tolerances of the method (see section 8), as those obtained using the standard anthracite.

5. PREPARATION OF SAMPLE

Crush the sample of air-dried coal to pass a 0.2 mm test sieve. Care should be taken to avoid an excessive production of particles smaller than 0.1 mm. It is essential that not less than 40 per cent of the total sample consists of particles between 0.1 and 0.2 mm. Mix the crushed sample thoroughly for at least 1 minute, preferably by mechanical means.

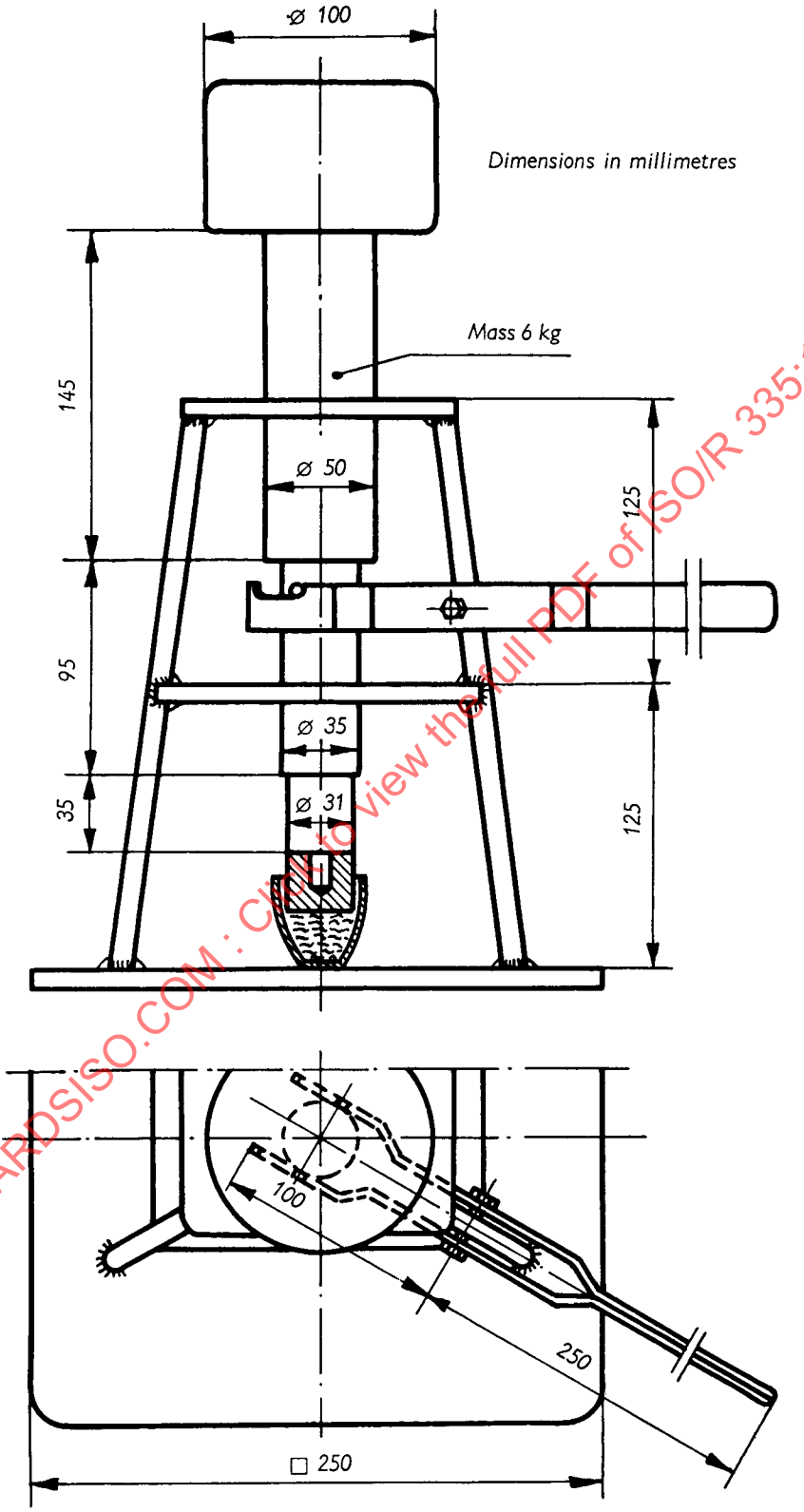
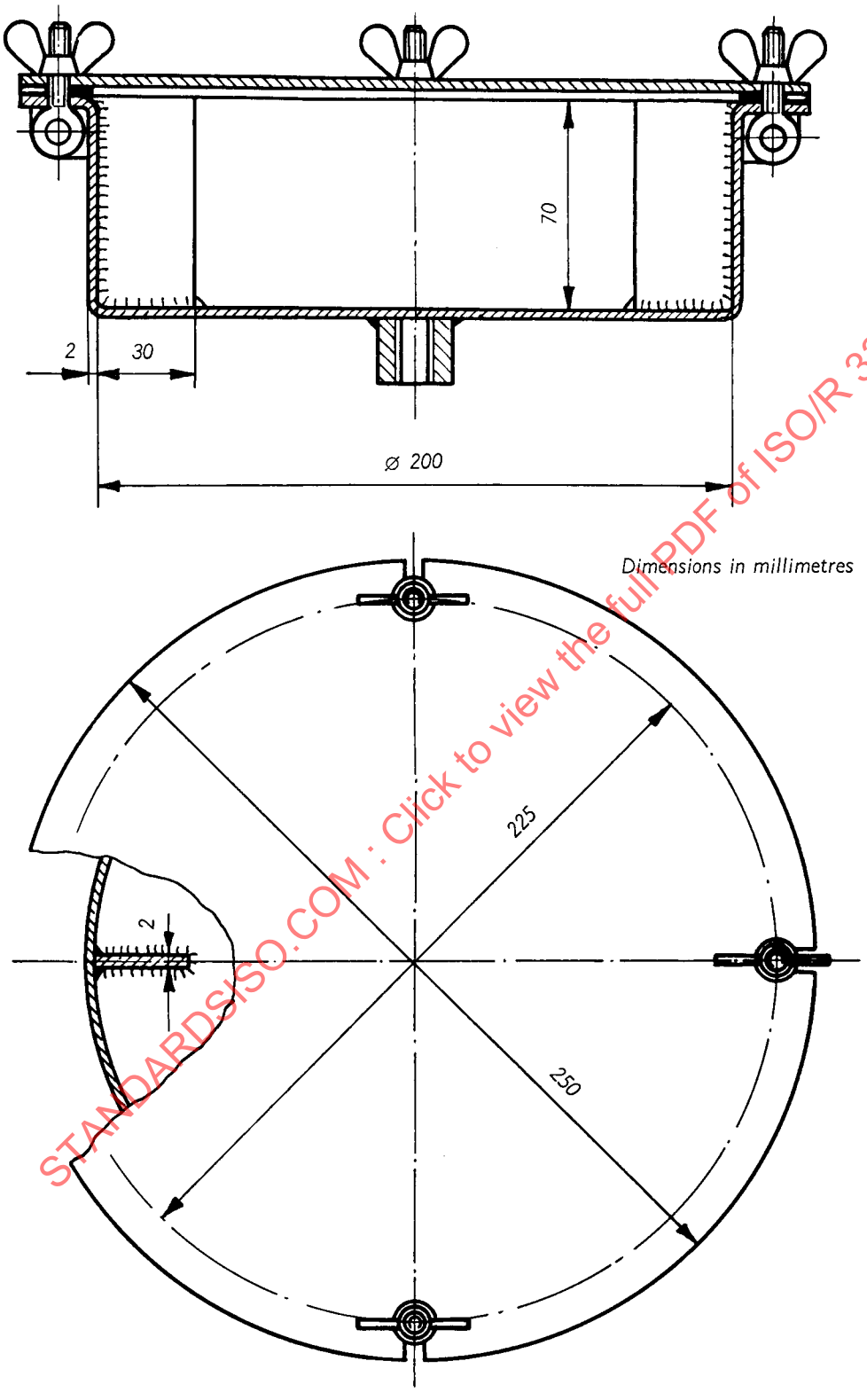


FIG. 1. — **Press used for compressing the mixture of anthracite and test coal.**



Dimensions in millimetres

FIG. 2. — **Drum used for abrasion test**