TC 134

International Standard 5311

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Fertilizers — Determination of bulk density (tapped)

Engrais — Détermination de la masse volumique après tassement

First edition — 1980-05-01

UDC 631.8 : 531.755 **Ref. No. ISO 5311-1980 (E)**

Descriptors : fertilizers, manure, density measurement, bulk density, settling.

Price based on 3 pages

Fertilizers — Determination of bulk density (tapped)

0 Introduction

The bulk density (tapped) of a fertilizer, together with the bulk density (loose), provides information relative to the required size of packaging materials, store-houses, stock-rooms etc. Generally, it ranges up to 10 % above the bulk density (loose), and sometimes it may exceed this value; like the bulk density (loose), it depends on the actual density, form of surface and the particle size of the fertilizer.

1 Scope and field of application

This International Standard specifies two methods for the determination of the bulk density (tapped) of solid fertilizers :

— the machine tapping method (method 1);

— the hand tapping method (method 2).

These methods are applicable to dry fertilizers only. If the fertilizer has absorbed moisture during transport or storage, it is necessary to dry it in an environmental chamber, with constant low humidity, prior to the determination.

Neither method is suitable for materials which contain a large proportion of particles exceeding 5 mm in diameter.

Method 2 is applicable only to spherical granules and to prills. It is not applicable to sharp-edged grains.

2 Reference

ISO 3944, *Fertilizers — Determination of bulk density (loose).*

3 Definition

bulk density (tapped) of a fertilizer : The mass per unit volume of a fertilizer after being poured into a container and compacted.

The bulk density (tapped) is expressed in grams per cubic centimetre (g/cm^3).

4 Sampling[1)]

The laboratory sample shall be sufficient for at least two determinations.

5 Method 1 — Machine tapping method

5.1 Principle

Pouring of the fertilizer from a specified funnel into a specified measuring cylinder of known volume, tapping by means of a tapping machine, and weighing of the contents of the cylinder.

5.2 Apparatus

5.2.1 Balance, capable of weighing to the nearest 1 g.

5.2.2 Apparatus for determination of bulk density (loose), according to ISO 3944, with a collar of transparent plastic and a measuring-cylinder holder with guide clamp (see the figure).

5.2.3 Tapping machine, having a camshaft the cams of which lift the guide clamp, measuring-cylinder holder and measuring cylinder once per revolution. The rotational frequency of the camshaft shall be 250 ± 15 min^{-1}.

5.2.4 Spatula, approximately 120 mm × 20 mm, or other suitable scraper.

5.3 Procedure

Pour into the closed funnel of the apparatus (5.2.2) a quantity of the fertilizer greater than that needed to fill the measuring cylinder.

Fully open the slide of the funnel so that the contents discharge into the measuring cylinder in 6 to 12 s.

NOTE — If the fertilizer does not flow freely, keep the outlet clear by inserting a rod of 3 to 4 mm diameter into the opening.

1) An International Standard on the sampling of fertilizers is in preparation.

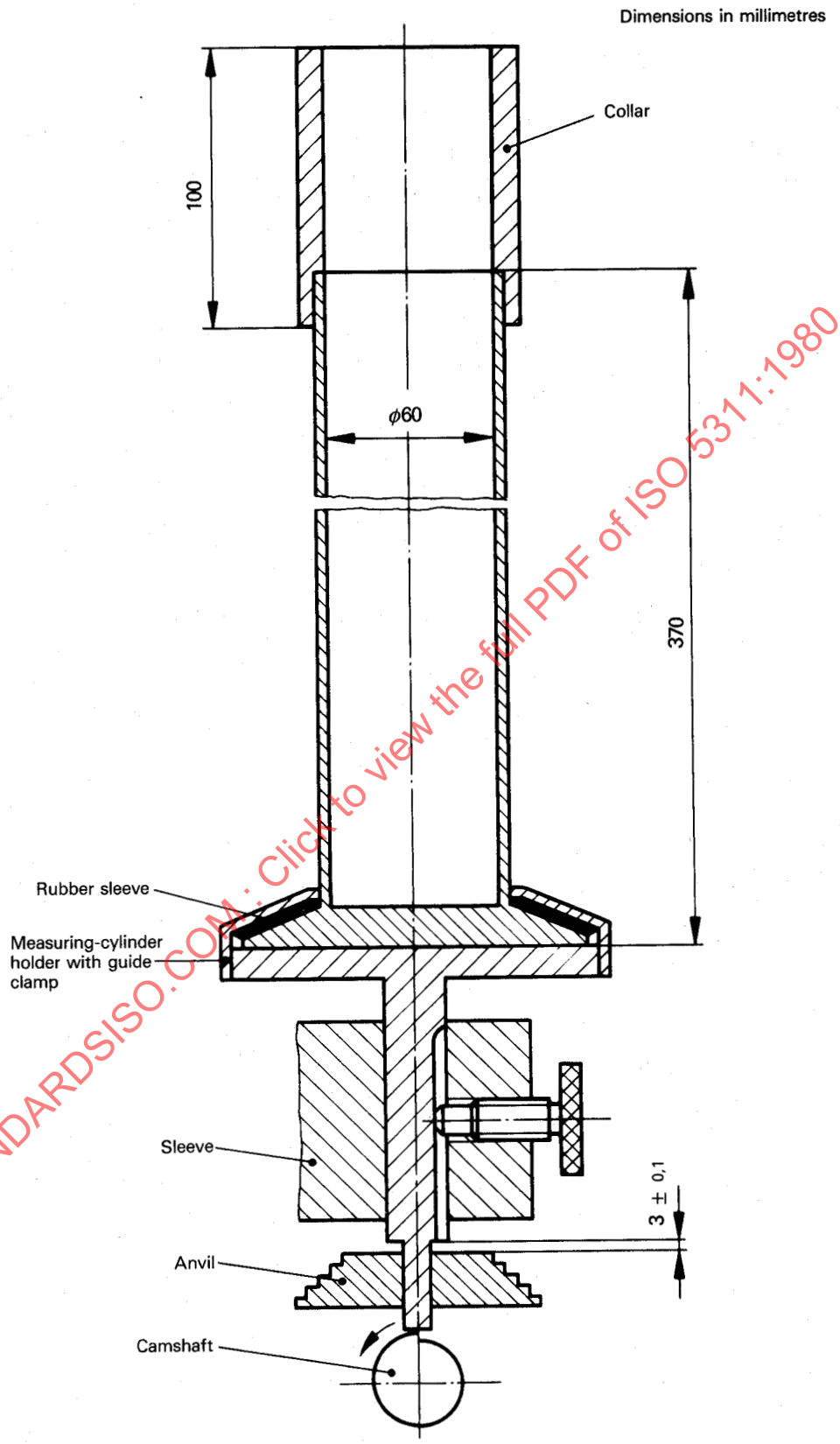

Figure — Apparatus for the determination of bulk density (tapped) by machine tapping