

Fertilizer distributors —

Part 2: Method of test for fertilizer distributors in lines

[ISO title: Equipment for distributing fertilizers — Test
methods — Part 2: Fertilizer distributors in lines]

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- Agricultural Engineers' Association
- British Agricultural and Garden Machinery Association Ltd.
- British Agrochemicals Association
- Health and Safety Executive
- Ministry of Agriculture, Fisheries and Food
- National Farmers' Union
- National Institute of Agricultural Engineering
- United Kingdom Agricultural Supply Trade Association Ltd.
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National foreword

This Part of BS 6483 has been prepared under the direction of the Agricultural Machinery and Implements Standards Committee. It is identical with ISO 5690-2:1984 “*Equipment for distributing fertilizers — Test methods — Part 2: Fertilizer distributors in lines*” published by the International Organization for Standardization (ISO).

Part 1 of BS 6483 describes methods of evaluating performance under laboratory and field conditions and is identical with ISO 5690-1:1982 “*Equipment for distributing fertilizers — Test methods — Part 1: Full width fertilizer distributors*”.

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words “this part of ISO 5690” appear, referring to this standard, they should be read as “this Part of BS 6483”.

Cross-references

International Standard	Corresponding British Standards
ISO 3534:1977	BS 5532:1978 <i>Statistics — Vocabulary and symbols</i> (Identical)
ISO 3944:1980	BS 5551 <i>Fertilizers</i> Part 3.1:1981 <i>Method for the determination of bulk density (loose)</i> (Identical)

The Technical Committee has reviewed the provisions of ISO 3339-0, ISO 3789, ISO 5699 and ISO 7424, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard. There is no corresponding British Standard for ISO 565 but BS 410 “*Specification for test sieves*” is related.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

0 Introduction

The aim of this part of ISO 5690 is to harmonize testing of fertilizer distributors in lines by means of a standardized test method which is reproducible, allowing comparable results in figures and graph form to determine their performance to be obtained.

The test method takes into account the effects of the type of fertilizer, the level of fertilizer in the hopper, the application rate adjustment, the forward speed, the slope of the ground and the condition of the soil surface (bumps).

Optional tests (see Annex C) may supplement the test by taking into account the distribution on the ground and the ease of use.

NOTE These tests may be combined with tests on the basic machine with which the distributor in lines is twinned.

1 Scope and field of application

This part of ISO 5690 specifies a test method for fertilizer distributors in lines, including fertilizer distributors attached to a basic machine.

NOTE Equipment designed for distributing microgranular pesticides or herbicides is excluded. ISO 5690-1 deals with full width fertilizer distributors. (See ISO 3339-0 for the classification.)

2 References

ISO 565, *Test sieves — Woven metal wire cloth, perforated plate and electroformed sheet — Nominal sizes of openings*.

ISO 3339-0, *Tractors and machinery for agriculture and forestry — Classification and terminology — Part 0: Classification system and classification*.

ISO 3534, *Statistics — Vocabulary and symbols*.

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

ISO 5698, *Agricultural machinery — Hoppers — Manual loading height*.

ISO 5699, *Agricultural machines, implements and equipment — Dimensions for mechanical loading with bulk goods*.

ISO 7424, *Agricultural equipment — Matching of wheeled tractors and rear mounted implements — Code numbering systems*.

3 Definitions

For the purpose of this part of ISO 5690, the following definitions apply.

3.1 fertilizer distributor in lines

[A definition is in preparation for the purpose of a future International Standard, ISO 3339-5.]

3.1.1

fertilizer distributor in lines twinned to a basic machine

an accessory which, from a hopper fitted to the chassis of a basic machine, lays down on the soil, in a band or in the soil, in one or several parallel lines with adjustable spacing, fertilizer at a given depth and application rate. For such purpose, for instance, the coulter of the basic machine to which they are attached may be used or separate coulters may be employed

3.2

feed mechanism (for fertilizer)

a mechanism which takes fertilizer from a hopper and transfers it at a constant determined flow rate on to the ground, in a band or in the soil, into a furrow via a feed pipe and possibly a coulter

3.3

flow rate (of fertilizer)

the quantity, expressed as mass or volume, of fertilizer distributed per unit time

3.4

application rate (of fertilizer)

the quantity, expressed as mass or volume, of fertilizer distributed per unit length or unit area

3.5

hopper height

the internal height of the hopper, H , shall be the vertical distance between the lower edge of the outlets and the lower edge of the top of the hopper

4 General test conditions

NOTE The manufacturer or his representative shall be entitled to be present at the tests.

4.1 Fertilizer distributor

4.1.1 Selection

The distributor to undergo testing may be selected by the representative of the test office in agreement with the manufacturer.

The distributor shall, in all respects, conform strictly to the specifications which the manufacturer is required to send to the test office in writing.

The test report (see Annex D) shall specify how the fertilizer distributor for test was chosen.

If the test on the distributor is associated with a test on a basic machine, the distributor chosen shall be that attached to the basic machine to be tested.

4.1.2 *Manufacturer's instructions*¹⁾

Use the distributor in accordance with the manufacturer's instructions, which shall specify, among other things

- a) the maximum working speed, expressed in kilometres per hour or metres per second;
- b) the types of fertilizer which the distributor can distribute;
- c) in the case where the device includes several interchangeable mechanisms, the type of feed mechanism and types of fertilizer which can be distributed by each model;
- d) any accessories which may be required for distributing certain types of fertilizer;
- e) the inflation pressure, if the distributor or the basic equipment is fitted with pneumatic tyres;
- f) the maximum and minimum application rates for the feed mechanisms with each type of fertilizer.

4.1.3 *Checking of specifications*

The technical characteristics supplied by the manufacturer shall be checked and shall be noted in the test report. When comparing laboratory test results with application rate and flow rate data supplied by the manufacturer, it shall be noted that manufacturer's data may have been adjusted for wheel slippage.

4.2 *Fertilizer*

4.2.1 *Type of fertilizer used for the tests*

Unless indicated otherwise by the manufacturer of the distributor (comment in the test report), carry out each of the performance tests with the following types of fertilizer:

- type a: a granular fertilizer;
- type b: a prilled fertilizer;
- type c: optionally, any other fertilizer which the test office considers of sufficient importance and whose physical properties differ from those of the fertilizers mentioned above.

4.2.2 *Physical properties of the fertilizer*

Determine the physical properties of the fertilizer used in the tests: particle size, bulk density (loose) (see ISO 3944), water content, and angle of repose (see Annex B). These values shall be noted in the test report.

4.3 *Ambient conditions*

The degree of atmospheric humidity shall be noted in the test report.

5 *Primary tests*²⁾

5.1 *Nature of tests* (see Annex A)

The essential aim of these tests is to determine the evenness of the flow rate and the accuracy of metering.

These tests shall be carried out according to two methods

- static tests;
- mobile tests;

to give the appropriate results.

5.1.1 *Static tests*

With the distributor stationary, the drive wheel shall rest on a drive mechanism. It shall be driven at a speed equal to that which it would have in actual operation, that is at the theoretic forward speed of the distributor travelling without slipping.

5.1.2 *Mobile tests*

The distributor shall be driven at a constant speed over a hard and uniform surface.

5.2 *Distance between the feed mechanism and the surface*

Care shall be taken that the mechanism is placed, in relation to the surface (collecting containers), at an average distance corresponding to that in actual operation.

5.3 *Types of tests*

5.3.1 *Evenness of flow rate*

The test shall be carried out with the machine stationary. The fertilizer shall be collected in containers placed under the feed mechanism or the coulters.

5.3.2 *Accuracy of metering*

5.3.2.1 *Over a uniform surface*

The test shall be carried out with the machine mobile. The fertilizer shall be collected in a series of containers placed on the ground. The collecting containers shall have external dimensions of 500 mm × 500 mm and shall have a minimum depth of 150 mm.

Preventive measures shall be taken to avoid spillage by ricochet out of the containers, for example by the use of

- interlocking inserts for dividing the container into cells of dimensions 50 mm × 50 mm, with a height not exceeding half the height of the container (see Figure 1);

¹⁾ These instructions shall be attached to the test report.

²⁾ For the optional tests, see Annex C.