

## SCHEDULE 2

### METHODS OF ANALYSIS

#### PART I

##### 14b.

#### DETERMINATION OF THE OIL RETENTION VALUE

##### 1 SCOPE AND FIELD OF APPLICATION

1. This method defines the procedure for the determination of the oil retention value of straight ammonium nitrate fertilisers containing more than 28% nitrogen by weight.

The method is applicable to both prilled and granular fertilisers which do not contain oil-soluble materials.

##### 2 DEFINITION

2. Oil retention value of a fertiliser: the quantity of oil retained by the fertiliser determined under the operating conditions specified and expressed as a percentage by mass.

##### 3 PRINCIPLE

3. Total immersion of the test portion in gas oil for a specified period, followed by the draining away of surplus oil under specified conditions. Measurement of the increase in mass of the test portion.

##### 4 REAGENT

###### 4

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Gas oil

Viscosity max: 5 mPas at 40° C

Density: 0.8 to 0.85 g/ml at 20° C

Sulfur content: <1.0% (m/m)

Ash:<0.1% (m/m)

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##### 5 APPARATUS

###### 5

5.1 Balance, capable of weighing to the nearest 0.01 gram.

5.2 Beakers, of capacity 500 ml.

5.3 Funnel, plastic, preferably with a cylindrical wall at the upper end, diameter approximately 200 mm.

5.4 Test sieve, aperture 0.5 mm, fitting into the funnel (5.3).

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(Note) The size of the funnel and sieve is such as to ensure that only a few granules lie one above another and the oil is able to drain away.

**5.5** Filter paper, rapid filtering grade, creped, soft, weight 150 g/m<sup>2</sup>.

**5.6** Absorbent tissue (laboratory grade).

## **6 PROCEDURE**

### **6**

**6.1** Carry out two individual determinations in quick succession on separate portions of the same test sample.

**6.2** Remove particles smaller than 0.5 mm using the test sieve (5.4). Weigh to the nearest 0.01 gram approximately 50 grams of the sample into the beaker (5.2). Add sufficient gas oil (Section 4) to cover the prills completely and stir carefully to ensure that the surfaces of all the prills are fully wetted. Cover the beaker with a watch glass and leave to stand for one hour at 25 (+2)° C.

**6.3** Filter the entire contents of the beaker through the funnel (5.3) containing the test sieve (5.4). Allow the portion retained by the sieve to remain there for one hour so that most of the excess oil can drain away.

**6.4** Lay two sheets of filter paper (5.5) (about 500 × 500mm) on top of each other on a smooth surface; fold the four edges of both filter papers upwards to a width of about 40 mm to prevent the prills from rolling away. Place two layers of absorbent tissue (5.6) in the centre of the filter papers. Pour the entire contents of the sieve (5.4) over the absorbent tissues and spread the prills evenly with a soft, flat brush. After two minutes lift one side of the tissues to transfer the prills to the filter papers beneath and spread them evenly over these with the brush. Lay another sheet of filter paper, similarly with its edges turned upward, on the sample and roll the prills between the filter papers with circular movements while exerting a little pressure. Pause after every eight circular movements to lift the opposite edges of the filter papers and return to the centre the prills that have rolled to the periphery. Keep to the following procedure: make four complete circular movements, first clockwise and then anticlockwise. Then roll the prills back to the centre as described above. This procedure to be carried out three times (24 circular movements, edges lifted twice). Carefully insert a new sheet of filter paper between the bottom sheet and the one above it and allow the prills to roll onto the new sheet by lifting the edges of the upper sheet. Cover the prills with a new sheet of filter paper and repeat the same procedure as described above. Immediately after rolling, pour the prills into a tared dish and reweigh to the nearest 0.01 gram to determine the mass of the gas oil retained.

*Repeating the rolling procedure and reweighing.*

**6.5** If the mass of gas oil retained in the portion is found to be greater than 2.00 grams, place the portion on a fresh set of filter papers and repeat the rolling procedure, lifting the corners in accordance with Section 6.3 (two times eight circular movements, lifting once). Then reweigh the portion.

## **7 EXPRESSION OF RESULTS**

### **7**

*Method of calculation and formula*

**7.1** The oil retention, from each determination (6.1) expressed as a percentage by mass of the sieved test portion, is given by the equation:

$$\text{Oil retention} = \frac{m_2}{m_1} \times 100$$

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where:

m1 is the mass, in grams, of the sieved test portion (6.2);

m2 is the mass, in grams, of the test portion according to Section 6.4 or 6.5 respectively as the result of the last weighing.

Take as the result the arithmetic mean of the two individual determinations.