# International Standard 5915



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# Sodium hexafluorosilicate for industrial use — Determination of particle size distribution — Sieving method

*Hexafluorosilicate de sodium à usage industriel — Analyse granulométrique — Méthode par tamisage*

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## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 5915 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in October 1978.

It has been approved by the member bodies of the following countries :

| | | |
|---|---|---|
| Australia | Hungary | Romania |
| Belgium | India | South Africa, Rep. of |
| Brazil | Israel | Switzerland |
| Bulgaria | Italy | Thailand |
| China | Korea, Rep. of | United Kingdom |
| Czechoslovakia | Mexico | USSR |
| Egypt, Arab Rep. of | Netherlands | Yugoslavia |
| France | Philippines | |
| Germany, F.R. | Poland | |

No member body expressed disapproval of the document.

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).



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# Sodium hexafluorosilicate for industrial use — Determination of particle size distribution — Sieving method

**WARNING — Sodium hexafluorosilicate is poisonous if taken internally. Breathing of the dust should be avoided. Contact with eyes and skin shall be prevented and operators should wash thoroughly after handling the material and should wear a respirator and goggles when handling the powdered material.**

**The sieving operations should be carried out in a fume cupboard in order to avoid the inhalation of dust.**

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a sieving method for the determination of the particle size distribution of sodium hexafluorosilicate for industrial use.

The method is intended to assess

a) the suitability of powdered material for volumetric dry-feed devices, and

b) the potential dust hazard (see Warning).

## 2 REFERENCES

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

ISO 2591, *Test sieving.*

## 3 PRINCIPLE

Sieving of a test portion for 15 min through a nest of sieves placed so that the sieve of largest aperture size is uppermost, followed by the other sieves in order of decreasing aperture size. Determination of the masses retained on each sieve. Calculation of the result as percentages passing through the different sieves.

## 4 APPARATUS

Ordinary laboratory apparatus, and

**4.1 Test sieves,** diameter 200 mm, aperture sizes 355 µm, 150 µm, 106 µm, 75 µm and 53 µm, complying with the requirements of ISO 565.

**4.2 Balance,** capable of weighing to an accuracy of 0,01 g.

**4.3 Electric oven,** capable of being controlled at 105 ± 1 °C.

**4.4 Clock glasses** or **evaporating basins,** 90 mm diameter.

NOTE — A test sieving machine is required if mechanical shaking is used (see 8.1).

## 5 SAMPLING[1)]

### 5.1 Laboratory sample

Use a sampler divider (rotary or riffle type) or coning and quartering to obtain a laboratory sample of between 40 and 60 g.

NOTE — A sample divider is preferred but the method of sample size reduction should be agreed between the interested parties.

### 5.2 Test sample

Condition the laboratory sample (5.1) by allowing it to stand in the laboratory until moisture equilibrium is reached, so that its mass will not change significantly by contact with the atmosphere during the test. If the laboratory sample is damp, first dry it in the oven (4.3), controlled at 105 ± 1 °C, and allow it to cool in the laboratory atmosphere.

## 6 PROCEDURE

### 6.1 Test portion

Weigh, to the nearest 0,01 g, the whole of the test sample (5.2).

1) An International Standard concerning the sampling of solid chemical products is in preparation.

### 6.2 Determination

Fit the required sieves (4.1) to a receiver with the sieve of largest aperture size uppermost and the other sieves in order of decreasing aperture size. Transfer the test portion (6.1) to the coarsest (uppermost) sieve and, after fitting the lid, agitate the sieves manually as specified in 4.6.3 of ISO 2591 so that the material rolls in an irregular motion over the apertures. Continue the agitation for 15 min. Weigh separately, to the nearest 0,01 g, the material remaining on each sieve and also that in the receiver by transfer to the clock glasses or evaporating basins (4.4), previously weighed to the same accuracy.

## 7 EXPRESSION OF RESULTS

Calculate for each sieve

a) the mass $m_1$, in grams, of material retained by that sieve plus that retained by the sieve(s) above, if any;

b) the percentage, by mass, of the test portion passing through each sieve, given by the formula

$$\frac{m_0 - m_1}{m_0} \times 100$$

where $m_0$ is the mass, in grams, of the test portion (6.1).

Express the results in the form of a table summarizing the percentages passing through the different sieves, commencing with the sieve with the largest aperture.

The sum of the percentage by mass retained by all the sieves, together with the mass of material retained in the receiver, should not be less than 99,5 % of the mass of the test portion. If the loss is greater than 0,5 %, repeat the test on a fresh test portion.

## 8 NOTES ON PROCEDURE

### 8.1 Mechanical sieving

A test sieving machine may, by mutual agreement, be used as an alternative to hand sieving but, if so, this and the particular machine specified used shall be stated in the test report.

NOTE – ISO 2591 specifies general principles to be followed for mechanical and hand sieving, both in respect of apparatus and procedures.

### 8.2 Reduction in number of sieves and variation in aperture sizes

Subject to agreement between the interested parties, the number of sieves may be reduced, and the aperture sizes may be varied, provided that not more than 50 % of the mass of the test portion is retained on any one sieve.

## 9 TEST REPORT

The test report shall include the following particulars :

a) an identification of the sample;

b) the reference of the method used;

c) the results and the method of expression used, whether hand or mechanical sieving was used and, if the latter, which particular machine, including the aperture sizes and, if desired, the number of sieves;

d) any unusual features noted during the determination;

e) any operation not included in this International Standard or in the International Standards to which reference is made, or regarded as optional.

## ANNEX

## ISO PUBLICATIONS RELATING TO SODIUM HEXAFLUOROSILICATE FOR INDUSTRIAL USE

ISO 4281 – Determination of free acidity and total hexafluorosilicate content – Titrimetric method.

ISO 5440 – Determination of phosphate content – Molybdovanadate spectrophotometric method.

ISO 5443 – Determination of iron content – 1,10-Phenanthroline spectrophotometric method.

ISO 5444 – Determination of loss in mass at 105 °C.

ISO 5915 – Determination of particle size distribution – Sieving method.

ISO 6229 – Determination of free silica content – Gravimetric method.