SRI LANKA STANDARD 672:1984

UDC 622.349.42

SPECIFICATION FOR
RUTILE

SRI LANKA STANDARDS INSTITUTION

Gr.4

SRI LANKA STANDARD
SPECIFICATION FOR RUTILE

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1984-12-20, after the draft, finalized by the Drafting Committee on Mineral Sands, had been approved by the Chemicals Divisional Committee.

The most common source of rutile is the natural beach sand rich in heavy minerals. In addition to rutile, the heavy mineral fraction of beach sand may contain ilmenite, garnet, zircon, monazite, sillimenite and baddeleyite. The major constituent of rutile is titanium dioxide (titania). Minor amounts of chromium, vanadium and manganese may occur within the rutile grain as impurities.

It is difficult to specify the exact chemical constituents of naturally occurring rutile as it can vary according to the chemical composition of mineralogic assemblage and lithologic association of the parent rock(s). However, percentile range of the constituents within which they usually vary, and a typical composition is given in Appendix A. The composition of a specific sample of naturally occurring rutile in respect of its suitability for use is left to be decided between the purchaser and the supplier.

All standard values given in this specification are in SI units.

For the purpose of deciding whether a particular requirement of this specification is complied with, the final value, observed or calculated, expressing the result of a test or an analysis, shall be rounded off in accordance with CS 102. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this specification.

In the preparation of this specification, valuable assistance derived from the relevant publications of the Indian Standards Institution is gratefully acknowledged.

1 SCOPE

1.1 This specification prescribes the requirements and methods of sampling and test for rutile.

2 REFERENCES

CS 102 Presentation of numerical values

SLS 676 Methods of test for heavy minerals

SLS 677 Methods for sampling of heavy minerals

3 REQUIREMENTS

3.1 Composition

3.1.1 The composition of rutile shall be as agreed to between the purchaser and the supplier. The methods of test for the constituents shall be as given in Table 1.

TABLE 1 - Methods of test for the constituents

Sl. No.	Constituent	Method of test Ref. to Clause No. of SLS 676
i	Titania (TiO_2)	5
ii	Silica (SiO_2)	6
iii	Iron (III) oxide (Fe_2O_3)	7
iv	Zirconia (ZrO_2)	10
v	Alumina (Al_2O_3)	11
vi	Phosphorous pentoxide (P_2O_5)	12
vii	Chromium oxide (Cr_2O_3)	13
viii	Vanadium pentoxide (V_2O_5)	14

NOTE - Apart from the analytical procedures described for the constituents, the use of instrumental test methods such as emission spectrography, atomic absorption spectrophotometry etc., may be employed as agreed to between the purchaser and supplier.

3.2 Moisture content

3.2.1 The moisture content of rutile shall be not more than two per cent by mass when tested by the method prescribed in Clause 15 of SLS 676.

3.3 Grain size

3.3.1 The grain size distribution of rutile shall be as agreed to between the purchaser and the supplier and shall be tested by the method prescribed in Clause 16 of SLS 676.

3.4 Purity

3.4.1 Purity of rutile shall be as agreed to between the purchaser and the supplier and shall be tested by an appropriate method as agreed to between the purchaser and the supplier.

4 PACKAGING

4.1 Unless otherwise agreed to between the buyer and the seller, rutile shall be packed in 6 ply paper sacks, made from kraft paper of substance not less than 80 g/m^2.

5 MARKING

5.1 If rutile is packed in paper sacks or any other packages the following information shall be legibly and indelibly marked:

a) Name of the material;

b) Name and address of the manufacturer/supplier;

c) Registered trade mark/trade name (if any); and

d) Net mass in kg.

6 SAMPLING

6.1 The method of drawing representative samples of the material for ascertaining conformity to the requirements of this specification, shall be as prescribed in Clause 5.5 of SLS 677.

6.2 Number of tests

6.2.1 Each package selected as in Clause 5.5 of SLS 677 shall be examined for packaging (4) and marking (5) requirements. (This may be done at the place of inspection).

6.2.2 The composite sample obtained as in Clause 7.1 of SLS 677 shall be tested for composition (3.1), grain size (3.3) and purity (3.4).

6.2.3 Each individual sample selected as in Clause 7.2 of SLS 677 shall be tested for moisture content (3.2).

7 METHODS OF TEST

7.1 Tests for the requirements laid down in 3 shall be carried out by the relevant method prescribed in SLS 676.

8 CONFORMITY TO STANDARD

8.1 The lot shall be declared as conforming to the requirements of this specification if the following conditions are satisfied:

8.1.1 Each package examined as in 6.2.1 satisfies the relevant requirements.

8.1.2 The composite sample tested as in 6.2.2 satisfies the relevant requirements.

8.1.3 The value of the calculated expression $\bar{X} + 0.4R$ for moisture content is less than or equal to the limit given in 3.2.

NOTES

1 Average ($\bar{X}$) - The value obtained by adding together all the test results and dividing the sum by the number of test results.

2 Range (R) - The difference between the maximum and minimum values of the test results.

APPENDIX A

COMPOSITION OF RUTILE

Constituents	Limits within which the constituents usually vary, per cent by mass	Typical composition, per cent by mass
Titania (TiO_2)	90 and above	96.76
Iron (III) oxide (Fe_2O_3)	Up to 2	0.89
Silica (SiO_2)	Up to 2	0.64
Zirconia (ZrO_2)	Up to 3	0.38
Alumina (Al_2O_3)	Up to 1	0.16
Phosphorous pentoxide (P_2O_5)	Up to 0.1	0.001

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SRI LANKA STANDARDS INSTITUTION

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