# BS 6057 : Part 3 : Section 3.14 : 1984
# ISO 2006-1974

UDC 678.031 : 531.36



British Standard

# Rubber latices

Part 3. Methods of test
Section 3.14 Determination of high-speed mechanical stability of synthetic rubber latices

[ISO title: Synthetic rubber latex — Determination of high-speed mechanical stability]

Latex de caoutchouc
Partie 3. Méthodes d'essai
Section 3.14 Détermination de la stabilité mécanique à vitesse élevée du latex d'elastomère de synthèse

Kautschuklatex
Teil 3. Prüfverfahren
Abschnitt 3.14 Bestimmung der mechanischen Stabilität von synthetischem Kautschuklatex beim Rühren mit höher Geschwindigkeit

**NOTE. Attention is drawn to BS 6057 : Part 0 'General introduction', issued separately.**

## National foreword

This Section of BS 6057 is identical with ISO 2006-1974 'Synthetic rubber latex — Determination of high-speed mechanical stability' published by the International Organization for Standardization (ISO) and confirmed in 1979. It supersedes method 4.2 of BS 3397 : 1976 'Methods of test for synthetic rubber latices'.

The main change incorporated in this standard is the addition of a description of a means of limiting foaming.

**Terminology and conventions.** The text of the international standard has been approved as suitable for publication as a British Standard without deviation. Some terminolgy 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 'International Standard' appear, referring to this standard, they should be read as 'British Standard'.

In **5.1.2** and clause **7**, 'rev/min' should be read as 'r/min'.

**Cross references**

| International standard | Corresponding British Standard |
|---|---|
| ISO 124-1974 | BS 6057 Rubber latices<br>Section 3.2 : 1981 Determination of total solids content of rubber latices (Identical) |
| ISO 1652-1974 | Section 3.11 : 1984 Determination of viscosity of rubber latices (Identical) |

The Technical Committee has reviewed the provisions of ISO 123-1974, to which reference is made in clauses **2** and **6**, and has decided that they are acceptable for use in conjunction with this standard. Method 3 of BS 3397 : 1976 is related to ISO 123-1974, and will eventually be replaced by BS 6057 : Part 2 'Sampling' (in course of preparation); it is intended that BS 6057 : Part 2 will be identical with a revision of ISO 123 (also in course of preparation).

It is intended that BS 6057 : Section 3.1 will be identical with ISO 35 which is referred to in clause **1** for information only.

**Additional information.** Water complying with BS 3978 'Water for laboratory use' is suitable for use in this determination (see clause **4**).

Suitable sieves complying with BS 410 'Specification for test sieves' are recommended for use as the preliminary filter (see **5.2**) and the test filter (see **5.3**).

In the final stage of the procedure (see clause **7**), it is recommended that the initial drying period, before the first weighing, should be 30 min.

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

British Standards Institution

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the high-speed mechanical stability of synthetic rubber latex.

The stirring disk which is specified has a greater diameter than that specified for natural rubber latex in ISO 35, *Natural rubber latex – Determination of mechanical stability.*

The test is applicable to synthetic rubber latices which have a viscosity, determined with the L instrument in accordance with ISO 1652, of up to 200 mPa·s (200 cP). Latices of higher viscosity shall be tested after dilution to a viscosity of 200 mPa·s (200 cP) or less, provided that such dilution[1] does not reduce the concentration of the latex by more than 10 % total solids.

The duration of stirring shall be so selected that the latex does not increase in temperature to more than 60 °C and does not exceed a height of 100 mm in the latex container. The duration of stirring shall be agreed between the interested parties and shall not be longer than 30 min or less than 1 min. In the case of a latex which contains ammonia, the duration of stirring shall be limited, since loss of ammonia by evaporation during the test may cause additional destabilization.

The test does not necessarily indicate the stability of a synthetic rubber latex to high shear stress, for which a rubbing test may be more applicable.

## 2 REFERENCES

ISO 123, *Rubber latex – Sampling.*

ISO 124, *Rubber latices – Determination of total solids content.*

ISO 1652, *Rubber latex – Determination of viscosity.*

## 3 PRINCIPLE

Stirring of the latex at high speed.

The amount of coagulum formed is regarded as an inverse measure of the mechanical stability of the latex.

## 4 REAGENT

**Soap solution**, 5 % solution of potassium oleate of pH value 10, or, for use with a latex which is coagulated by potassium oleate solution, 5 % solution of a synthetic anionic surfactant.

Distilled water or water of equivalent purity shall be used wherever water is specified.

## 5 APPARATUS

**5.1 Mechanical stability measuring apparatus**[2], consisting of the following items :

**5.1.1** *Latex container*, flat-bottomed, cylindrical, at least 100 mm high, with an internal diameter of 58 ± 2 mm. The inner surface shall be smooth, and a glass container is preferred.

**5.1.2** *Stirring apparatus,* consisting of a vertical stainless steel shaft of sufficient length to reach to the bottom of the latex container (5.1.1) and tapering to 6,35 mm diameter at its lower end, where is attached a horizontal, smooth, stainless steel disk 36,12 ± 0,03 mm in diameter and 1,58 ± 0,05 mm thick by means of a threaded stud at the exact centre of the disk. The apparatus shall maintain a stirring speed of 14 000 ± 200 rev/min throughout the test, at which speed the shaft shall not run out of true by more than 0,25 mm.

**5.1.3** *Holder* for the latex container (5.1.1). The holding arrangement shall ensure that the axis of the rotating shaft is concentric with that of the latex container and that the bottom of the stirring disk is 13 ± 2 mm from the inner surface of the bottom of the latex container.

**5.2 Preliminary filter** of stainless steel wire cloth with an average aperture width of 180 ± 15 µm.

**5.3 Test filter** consisting of a disk of stainless steel wire cloth with an average aperture width of 180 ± 15 µm, dried to constant mass and weighed to the nearest 1 mg, firmly clamped between two stainless steel rings of equal internal diameter between 25 and 50 mm.

1) Dilution of the latex decreases its stability because the balance of free and absorbed soap is changed.

2) Suitable instruments are commercially available.

## 6 SAMPLING

Carry out the sampling in accordance with one of the methods specified in ISO 123.

## 7 PROCEDURE

If the total solids content of the latex is not known, determine it in accordance with ISO 124.

If the viscosity of the latex determined with the L instrument (according to ISO 1652) exceeds 200 mPa·s (200 cP), dilute it to this or a lower value, with an amount of water which reduces the concentration of the latex by not more than 10 % total solids.

Adjust the temperature of the latex to 25 ± 3 °C, pass it through the preliminary filter (5.2) and transfer 50 ± 0,5 g to the latex container.

Place the container (5.1.1) in position, and stir the latex at 14 000 ± 200 rev/min for the agreed time, between 1 and 30 min, and of such duration that the latex does not increase in temperature to more than 60 °C and does not exceed a height of 100 mm in the container. If it is necessary to limit foaming, a paste of a silicone defoamer shall be smeared around the upper portion of the inner surface of the container.

Immediately after the termination of stirring, remove the latex container and wash the stirrer shaft and disk free from latex deposits with soap solution. Wet the test filter (5.3) with soap solution and pour the latex and washings into the test filter. Use soap solution to ensure quantitative transfer of all latex and deposits including skin. Wash the residue on the test filter with soap solution until it is free from latex and then with water until the washings are neutral to litmus. Carefully remove the test filter containing the wet solid matter and swab the underside with filter paper. Dry the test filter and coagulum at 100 ± 2 °C until the change in mass is less than 1 mg during 15 min drying.

## 8 EXPRESSION OF RESULTS

The high-speed mechanical stability of the latex shall be reported as the percentage of coagulum which is formed. Calculate it as a percentage by mass of the latex, using the formula

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

where

$m_0$ is the mass, in grams, of the test portion;

$m_1$ is the mass, in grams, of coagulum.

## 9 TEST REPORT

The test report shall include the following particulars :

a) the reference of the method used;

b) the results expressed as a percentage by mass of the latex;

c) the total solids content at which the latex was tested;

d) the duration of stirring, in minutes;

e) the name of the silicone defoamer used, if required;

f) any unusual features noted during the determination;

g) any operation not included in this International Standard or regarded as optional.

## Publications referred to

See national foreword.

BS 135

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# ISO 2006-1974

This British Standard, having been prepared under the direction of the Rubber Standards Committee, was published under the authority of the Board of BSI and comes into effect on
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The Committees responsible for this British Standard are shown in Part 0.

The following BSI references relate to the work on this standard:
Committee reference RUC/38
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Amendments issued since publication

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