

DRAFT TANZANIA STANDARD

**TBS/CDC-2(5220) P3 Surface active agents – Methods for performance tests -
Part 1: Relative dispersing power (Revision of TZS 224-1: 1984)**

TANZANIA BUREAU OF STANDARDS

Foreword

This part of Draft Tanzania Standard is being developed by the Soap and Detergents Technical Committee under supervision of the Chemical Division Standards Committee and it is in accordance with the procedures of the Bureau.

This Draft Tanzania Standard is the first revision of TZS 224: 1984 Surface active agents – Methods for performance tests - Part 1: Relative dispersing power. This edition maintains the first approved methods.

Tests for emulsifying power, foaming power and relative detergency of surface active agents are covered in Part 2, Part 3 and Part 4 respectively of this standard.

In the preparation of this Tanzania standard, assistance has been derived from:
IS 5785 (Part 1) – 2016 *Methods for performance tests for surface active agents –Part 1: Relative dispersing power: published by Indian Standards Institution.*

In reporting the result of a test analysis made in accordance with this standard if the final value observed or calculated is to be rounded off, it shall be done in accordance with TZS 4 *Rounding off numerical values.*

Surface active agents – Methods for performance tests - Part 1: Relative dispersing power

1 Scope

This part of Draft Tanzania standard prescribes the method of test for evaluating the relative dispersing power of surface active agents used in the textile industry.

2 Normative reference

The following referenced documents are indispensable for the application of this document. The latest edition of the referenced document (including any amendments) applies.

TZS 59 *Water for analytical laboratory use – Specification and test method*

3 Terminology

For the purpose of this Tanzania standard the following definition shall apply:

Surface active agents

organic compounds or products used for the purpose of washing scouring, wetting, penetrating, emulsifying, dispersing, etc.

Note 1- These auxiliary products are capable of modifying the surface or the boundary between two phases which may be entirely different in physical state; for example, between the textile fibre or water insoluble powder and aqueous solution, or between non-miscible liquids, such as water and soil.

4 Outline of method

A known amount of finely divided carbon black is suspended in different concentrations of the surface active solutions for different durations of time. After a definite interval of time a known amount of solution is taken from the center of the solution and amount of solid dispersed in the liquid is determined.

5 Apparatus

The following apparatus are required:

- a) *Graduated cylinders* – of 250 mL capacity, provided with a glass stopper;
- b) *Petri dishes* – of 100 mm nominal size; and
- c) *Pipette* – of 5 mL capacity.

6 Reagents

6.1 Quality of reagents

Unless specified otherwise, analytical chemicals and distilled water complying with TZS 59 (see clause 2) shall be used.

Note 2 – 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

6.2 Carbon black – finely divided carbon black about 18 nm particle diameter.

Finely divided iron oxide of 15 to 21 nm particles diameter may also be used instead of carbon black.

6.3 White oil

7 Preparation of solution

Dissolve separately 25 g of different surface active agents under test in sufficient amount of water and make up the volume of each solution to one litre.

8 Procedure

8.1 Take a 250 mL graduated cylinder for each of the surface active agents. Weigh 4 g of carbon black and transfer it to the cylinder. Add 5 mL of white oil to it and also 40 mL of 2.5% solution of the surface active agent. Make up the volume to 200 mL by adding more of water. Prepare similarly solutions of all the surface active agents in separate cylinders.

8.2 Stopper each cylinder, hold them upright and tilt in the clockwise direction to invert with stopper down and restore back in the same way. Repeat the procedure 10 times and then keep the cylinders stationary without disturbing the contents.

Note 3 – The shaking should be uniform and unnecessary jerks should be avoided.

8.3 After a period of 1 h, pipette out exactly 5 mL of solution from the center of each cylinder (see Note 4) and transfer each aliquot portion to a previously tared petri dish. Evaporate the solutions in different dishes on the water-bath and dry the residue at 105 °C to 110 °C to constant mass (see Note 5).

Notes:

- 4) Mark the pipette at a place which coincides with the top of the cylinder when the tip of the pipette is at 100 mL graduation mark on the cylinder.
- 5) The residue shall be taken to have attained constant mass when two consecutive weighing taken at an interval of 30 min do not differ by more than 2 mg.

8.4 Repeat the procedure given in 8.3, but pipetting out the solutions from each cylinder after an interval of 2, 5 and 24 h.

8.5 Repeat the procedure given in 8.1 to 8.4, but taking 80, 120 and 160 mL of solutions of different surface active agents each for 1, 2, 5 and 24 h duration.

9 Calculation and reporting

9.1 Calculation

9.1.1 Calculate separately the percentage of the solid dispersed by each surface active agent by the following formula:

$$C = \frac{M - D}{4\ 000}$$

Where

C is the percentage of the solid dispersed,
M is the mass in milligrams of the residue, and
D is the mass in milligrams of surface active agent (8.3) when dried at 105 or 110°C to constant mass.

9.1.2 Calculate separately the percentage of the solid dispersed by each surface active agent at the end of the different durations of time (1, 2, 5 and 24 h). Calculate separately for each concentration of each surface active agent.

9.2 Draw the graphs of different concentrations of the surface active agent against the percentage of solid dispersed after one hour time duration, with a different curve for each surface active agent. Similarly draw the graphs for 2m 5 and 24 h time duration.

NOTE – If the test is carried out for other duration of time, graphs for the corresponding time duration may be drawn.

9.3 Report

From the graphs compare the results to determine the relative dispersing power of surface active agents bearing in mind that for the same duration of time and the same concentration of different surface active agents, the higher the percentage of solids dispersed, the more efficient is the corresponding surface active agent.