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SOUTH AFRICAN NATIONAL STANDARD

Viscosity of binders for paints

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Change No.	Date	Scope

Foreword

This South African standard was approved by National Committee SABS/TC 1006/SC 02, *Detergents, polishes and other chemicals – Detergents, soaps, cleaners, degreasers and oil spill dispersants and absorbents*, in accordance with procedures of the SABS Standards Division, in compliance with annex 3 of the WTO/TBT agreement.

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Viscosity of binders for paints

1 Scope

This standard specifies a method for the determination of the viscosity of binders for paints.

2 Apparatus

2.1 Bubble viscosity test tube of clear glass and closed, flat, even bottom that has the following dimensions and markings.

a) internal diameter of 10,75 mm ± 0,025 mm;

b) internal length of 112 mm ± 0,05 mm;

c) an etched line round the outside of the tube 5 mm from the open end; and

d) a second etched line round the outside of the tube, 13 mm from the open end.

2.2 Bubble viscosity tube holder with rack and pinion capable of inverting bubble viscosity test tubes and calibrated reference standard tubes 180° to within 1° of a vertical position.

2.3 Thermostatically-controlled water bath, capable of maintaining a temperature of 25 ºC ± 0,25 ºC.

3 Calibrated reference standard tubes

A series of calibrated reference standard tubes, of the same dimensions and markings of those described in 2.1 and filled with transparent liquids that have predetermined viscosities and that are marked alphabetically with the long established Gardner-Holdt letter standards[1] as listed in table 1.

[1] Gardener-Holdt viscosity standard tubes are manufactured by BYK Gardner, Lausitzer Strasse 8, Geretsried, Germany and are commercially available from the World Wide Web http://www.byk.com.

This information is given for the convenience of users of this standard and does not constitute endorsement by the SABS Standards Division of the product named.

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Table 1 – Gardner-Holdt letter standards for comparator viscosity bubble tubes

1	2
Gardner-Holdt letter	**Viscosity** [a] Pa.s
A	0,050
B	0,065
C	0,085
D	0,100
E	0,125
F	0,140
G	0,165
H	0,200
I	0,225
J	0,250
K	0,275
L	0,300
M	0,320
N	0,330
O	0,340
P	0,400
Q	0,440
R	0,470
S	0,500
T	0,550
U	0,627
V	0,884
W	1,070
X	1,290
Y	1,760
Z	2,270
[a] Extracted from ASTM D1545-07 and BYK Gardner website data.	

4 Sampling

Take a laboratory sample as specified in the relevant product standard. Where no standard exists, take the laboratory sample as agreed upon between the test laboratory and the manufacturer to ensure a reasonable and acceptable reliability at a reasonable and acceptable confidence level.

5 Test specimen preparation

5.1 From the laboratory sample taken in accordance with clause 4, prepare a test specimen of approximately 150 mL by straining the test specimen through a fine filter paper to ensure that the test specimen is free from solid particles.

5.2 Fill a bubble viscosity test tube (see 2.1) with the filtered test specimen (see 5.1) that is free from air bubbles, to a level such that, when a cork stopper is inserted, the bottom of the cork stopper is level with the upper etched line on the bubble viscosity test tube.

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6 Procedure

6.1 Knowing the approximate viscosity of the laboratory sample, select four calibrated reference standard tubes (see clause 3) closest in viscosity to the laboratory sample.

6.2 If the approximate viscosity of the laboratory sample is not known, select the four calibrated reference standard tubes that, when inverted, produce moving air bubbles of substantially the same length as the air bubble produced by the inverted test specimen tube (see 5.2).

6.3 Insert the test specimen tube and selected calibrated reference standard tubes in the bubble viscosity tube holder (see 2.2) and immerse in the thermostatically controlled water bath at a temperature of 25 ºC ± 1,0 ºC (see 2.3).

6.4 Allow the viscosity tube holder and tubes to stand in a water bath for a minimum of 10 min before removal.

6.5 Remove the viscosity tube holder and tubes from the water bath and immediately invert them.

6.6 Allow the viscosity tube holder and tubes to remain inverted for twice the anticipated time of traverse of the bubbles within the tubes, in order to bring the bubbles to complete rest in the inverted position.

6.7 Quickly turn the viscosity tube holder and tubes back to the upright position and visually compare the rise time of the bubble in the test tube to the rise time of the bubbles in the calibrated reference standard tubes.

6.8 Record the Gardner-Holdt letter standard which most closely matches the test specimen tube in rate of bubble rise.

7 Test report

Report the following information:

a) all the data needed to identify the laboratory sample tested;

b) confirmation that the test was carried out in accordance with this standard;

c) any deviation from this standard; and

d) the viscosity of the sample, in the Gardner-Holdt letter standard representing the calibrated reference standard that most closely matched the rate of bubble rise of the specimen tested, but for viscosities greater than “U” (0,627 Pa.s), report the letters of the two calibrated reference standards of which the rate of bubble rise in each is respectively just above and just below that of the specimen tested.

Bibliography

ASTM D1545-07, *Standard test method for viscosity of transparent liquids by bubble time method.*

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