STATE STANDARD

Silicone Compounds "Vicsint"

Specifications

TU 38.103508-81

(Abstract)

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The specifications refer to heat-resistant elastic silicone compound "Vicsint" which is a thick-flowing composition of two components:sealing paste and catalyst.The compound shall be prepared in the place of consumption.When mixing the specified components at room temperature curing occurs with the compound transition from its thick-flowing condition to a rubber-like material.

The compound "Vicsint" is a thick-flowing composition consisting of K paste and catalyst No. 68. The compound is serviceable in the temperature range of minus 70 °C to 250 °C and has the following life:at a temperature of200 °C – 2500 h; at a temperature of 250 °C – 1500 h.

The compound "Vicsint K-68" is intended for sealing various items operating in the air medium and conditions of high humidity.Contact with the compound "Vicsint K-68" within the operating temperature range does not cause corrosion of non-anodized, unclad aluminum, cadmium- and zinc-plated steels with chromium passivation, brass and silver coating, at warm-up temperatures of 60, 100, 150 °C does not cause corrosion of tin coating and copper; at warm-up temperatures of 200 °C and 250 °C does not intensify corrosion of copper.

To provide for adhesion of compound to the surfaces of sealed items, interlayer P-11(П-11) shall be used (abstract from TU 38.303-04-06-90).

An example of product record when ordering and in the other product documentation: compound "Vicsint K-68", grade A as per TU 38.103508-81.

1. TECHNICAL REQUIREMENTS

1.1. Depending on paste K viscosity compound "Vicsint K-68" is produced of two grades: Grade A – for sealing; grade B (Б) –for encapsulation.

1.2. The paste K shall meet the requirements and standard values given in Table 1.

Table 1

Parameter	Standard value for grades		Test method
	A	B (Б)	
1. Exterior view	Thick-flowing material colored from white to dark grey. Allowed is sedimentation of filler spreading during mixing		To be inspected visually in transmitted light
2. Relative viscosity perviscometer VZ-1 (ВЗ-1) with nozzle diameter of 5.4 mm, minimum	10.0–25.0	25.1–45.0	As per item 3.3 of the present specifications

1.3. The catalyst No. 68 shall comply with the requirements of TU 38.303-04-05-90.

1.4. The interlayer P-11 (П-11) shall comply with the requirements of TU 38.303-04-06-90.

1.5. The compound "Vicsint K-68"pot life is 0.5 h. to 6.0 h.

1.6. The cured compound "Vicsint K-68" shall comply with the requirements and standard values given in Table 2.

Table 2

Parameter	Standard value for "Vicsint K-68" grade	Test method
1. Nominal strength under tension, MPa (kgf/cm^2), minimum	1.67 (17)	1.96 (20)
2. Elongation break, %, minimum	80	80
3. Shore scleroscope hardness A, standard units	55–70	55–70
4. Adhesion strength between compound and metal when using interlayer P-11 (П-11), kN/m (kgf/cm), minimum	0.69(0.7)	Appendix to GOST 21981-76, item 3.4 of the present Specifications

Note:

1. The test of parameters specified in Table 2 shall be conducted on specimens made to the formula:

"Vicsint K-68", grades A and B (Б), – paste "K"– 100 weight parts

catalystNo. 68 – 3 to 6 weight parts.

2. When determining adhesion strength between the compound and metal no compound separation from the metal plate surface is allowed.

1.7. The "Vicsint K-68" compound is supplied in batches as separate components as follows:

Paste "K" – 100 weight parts,

Catalyst No. 68 – 6 weight parts,

Interlayer P-11 (П-11) – 2.5 weight parts.

2. SAFETY REQUIREMENTS

2.1. The paste "K" being a part of the set has toxic properties; for its transportation, storage and use special safety rules are not mandatory. Its cured stock does not have any toxic properties as well.

2.2. The paste "K" does not contain any volatile products, their MAC (ПДК) is not subject to limitation, and they are not soluble in water.

The paste has no negative influence on the human body.

2.3. The paste does not form any toxic and fire and explosion hazardous compounds in presence of other substances and external factors.

The paste is fire and explosion proof, combusts only when entering a source of fire without forming toxic products, and it can be extinguished with any fire fighting means.

3. TEST METHODS

3.1. Paste "K" exterior view test.

The paste "K" exterior view shall be tested by visual inspection of a product sample layer of 1–2 mm applied on a 90 × 120 mm glass plate on a white background under reflected light.

3.2. Compound pot life test.

3.2.1. Equipment, materials, reagents:

Porcelain, metal and polyethylene containers;

Metal or porcelain spatula;

Metal plates or plates of organic glass with unlimited dimensions;

Catalyst No. 68 as per TU 38.303-04-06-90.

3.2.2. Test procedure

The paste "K" and catalyst shall be thoroughly mixed with a spatula in the porcelain (metal, polyethylene) container to achieve a homogeneous mix. Then a 2 mm thick mix layer shall be poured on a smooth plate and kept at a temperature of 15 °C to 30 °C. The duration of the compound pot life loss is determined in the following manner:throughout the entire layer thicknessthe compound shall be shorn with a metal or porcelain spatula and a rubber-like film formation shall be noticed on the sample surface in shear.

3.3. Paste "K" relative viscosity test.

3.3.1. Equipment, instruments

Viscometer VZ-1 (B3-1).

Laboratory glass mercury thermometer with a measurement range of 0 °C to 55 °C and graduation mark of 0.5 °C maximum.

Stopwatch with a maximum error of 0.2 s.

Measuring tube with capacity of 50 cm^3.

3.3.2. Test preparation

Before determination of relative viscosity the test paste sample shall be mixed thoroughly, avoiding formation of air bubbles in the paste.

Right before the test, the viscometer and the test material shall be warmed up to a temperature of (20 ± 0.5) °C.

The viscometer and especially the nozzle shall be thoroughly cleaned with solvent.

3.3.3. Test procedure.

The viscometer bath shall be filled with water for maintaining the test material temperature of (20 ± 0.5) °C, then the nozzle shall be closed with a rod and the internal tank filled with the test material to the level of the hook points, then using the holder set screws the viscometer shall be fixed in such a way that all three hook points are in a single plane and slightly visible on the test material surface.The internal tank shall be closed with a lid in the hole of which a thermometer shall be installed, a measuring tube shall be placed under the viscometer nozzle.

After air bubbles rise to the test material surface and at temperature of (20 ± 0.5) °C the rod shall be quickly withdrawn, concurrently with the test

material appearance from the viscometer nozzle the stopwatch shall be started. When the test material in the measuring tube reaches precisely the mark level of 50 cm^3 the stopwatch shall be stopped and flow time counted with a maximum error of 0.2 s.

3.3.4. Processing of results

Relative viscosity is calculated using the following formula:

$$X = t \cdot K,$$

where: t is an arithmetic average of the test material flow time, s;

K is a correction factor of the viscometer.

An arithmetic average of at least three measurements of flow time (expressed in seconds) shall be assumed as a test result. The permissible deviations of individual flow time determinations from the arithmetic average shall not exceed ±3 %.

A correction factor for viscometers shall be calculated by time comparison of test fluid flow from the reference viscometer and the viscometer under test at a temperature of (20 ± 0.2) °C.

To set a correction factor grade MS-20 (MC-20) or grade MK-22 aviation oil shall be used.

Correction factor (K) shall be calculated using the following formula:

$$K = \frac{t_1}{t_2},$$

where: t_1 is the time of test fluid flow from the reference viscometer, s;

t_2 is the time of test fluid flow from the test viscometer, s.

A correction factor for the viscometers in service shall be calculated once a year and the correction factor value shall be specified in the viscometer calibration certificate.

In absence of a reference viscometer it is allowed to calculate the test fluid flow time (t_1) in seconds using the following formula:

$$t_1 = 0.063 \cdot \nu + 1.4,$$

where: ν is test fluid kinematic viscosity at a temperature of (20.0 ± 0.2) °C, cSt.

3.4. Determination of nominal strength under tension and percentage of elongation of compound.

Determination of nominal strength, percentage of elongation is carried out according to Appendix to GOST 21751-76 on the type 1 specimens of (2.0 ± 0.2) mm thick with the following supplements:

Compounds prepared as per item 3.2.2 shall be used for specimens making.The specimens intended for physical and mechanical testing shall not have air bubbles for which the compound is vacuum treated prior to pouring at a vacuum gage pressure of 986 HPa to 993 HPa (residual pressure of 15 to 20 mm Hg) at a temperature of 15 to 30 °C until foam formation stops.After vacuum treatment the compound shall be poured into moulds made as per Appendix to GOST 21751-76 and aged during 72 hours from the time the polymer is mixed with the catalyst at a temperature of 15 °C to 30 °C. One shall use moulds as per Appendix to GOST 21751-76 or metal moulds or moulds of organic glass with smooth polished surface in the form of 240 × 240 mm plates equipped with regulating screws for fixing them in the horizontal position and a template of the same material with internal dimensions of 200 × 200 × 2 mm which shall be tightly pressed by clamps against the mould base.

After expiration of the specified period the cured compound plates shall be taken out of the moulds and standard specimens shall be cut out.

The movable clamp movement rate is 500 mm/min.

The specimens are allowed to be kept in the air for 24 to 72 hours at a temperature of 15 °C to 30 °C if the obtained test results comply with the specifications.

An arithmetic average of all values for tested specimens shall be assumed as a test result of nominal strength under tension.If the test results deviate from the average value of strength by more than ±20 % they shall not be considered and the arithmetic average shall be calculated for the remaining specimens (at least three). If after the results processingless than three specimens were left the test shall be repeated. The specimens ignored during the nominal strength average calculation shall not be considered in the percentage of elongation calculation.

3.5. Hardness measurement

The compound hardness measurement shall be taken on the plates made as per item 3.4 before cutting out the specimens. The plates shall be superimposed one on another to total thickness of (6.0 ± 0.2) mm.

3.6. Adhesion strength of compound with metal testing using interlayer P-11 (П-11).

The adhesion strength of compound with metal shall be tested as per Appendix to GOST 21981-76. The test specimens shall be prepared as per Appendix to GOST 21981-76 with the following supplements.

Plates of D16 (Д16) aluminum alloy with the anode film filled with potassium bichromate shall be degreased and cleaned from dust and dirt with a cloth soaked in benzine (acetone, ethyl alcohol) and dried in the air at a temperature of 15 °C to 30 °C. A layer of interlayer P-11 (П-11) shall be applied with a brush on the prepared surface. The applied layer shall be dried in the air at a temperature of 15 °C to 30 °C during 40 minutes at least and then 70 g of compound prepared as per item 3.2 shall be poured into a rectangular 136 × 107 × 10 mm mould made of metal or organic glass and treated with 5 %-solution ofpolyisobutylene in

benzine.Thedegreased metal meshes No. 07 or 09 (Appendix to GOST 3826-82) shall be superimposed on the plates that shall be placed into a mould with meshes down.The prepared specimens shall be kept in moulds at a temperature of 15 °C to 30 °Cduring 72 h and then the specimens shall be taken out of the moulds.

The sample testing and test results processing shall be carried out as per Appendix to GOST 21981-76. The number of test specimens shall not be less than 5. An arithmetic average of all values of tested specimens shall be assumed as a test result.If the test results deviate from the average value by more than ±20 % they shall not be considered and the arithmetic average shall be calculated for the remaining specimens (at least three). If after the results processingless than three specimens were left the test shall be repeated.

4. TRANSPORTATION AND STORAGE

4.1. The paste "K" being a compound component may be transported by all means of transport in accordance with the rules applicable to a particular means of transport.

4.2. The paste "K" shall be stored in warehouses at a temperature of 0 °C to plus 30 °C.

4.3. The interlayer P-11 (П-11) shall be transported and stored as per Abstract from TU 38.303-04-06-90.

4.4. The catalyst No. 68 shall be transported and stored as per Abstract from TU 38.303-04-05-90.

5. MANUFACTURER'S WARRANTY

5.1.The manufacturer guarantees the compound compliance with the specifications provided that transportation, storage and use conditions are observed by the consumer.

Shelf life of the paste "K" is one year after manufacture date.

The component (interlayer, catalyst) shelf life shall comply with the requirements of their standard technical documentation mentioned in Section 1 of the Specifications.

After the shelf life expiry the compound shall be tested before each application for its compliance with the requirements of the Specifications and in the event compliance is ascertained the compound can be used for intended purpose.