

SECRET/CLASSIFIED

NUMBER TY 38 103420-78. (15)

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SUPERSEDES

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Sealing compound "Wickcent Y-1-18"

Technical specifications

TY 38 103420-78.

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These technical specifications deal with the sealing compound "Vickcent Y-1-18" intended for surface hermetic sealing of metallic joints from stainless steel, aluminium and titanic alloys ^{and} for hermetic sealing of equipments working in air medium at temperatures from minus 60 to plus 300° under the effect of vibratory, impact and repeated, variable loads.

Sealing compound "Vickcent Y-1-18" is recommended for use in various climatic conditions. Sealing compound "Vickcent Y-1-18" is a sealing-heat resistant material of white colour, capable of changing from paste ~~paste~~ forming condition to rubber condition. After ~~forming condition to rubber condition~~ ~~after~~ mixing with catalyst No. 18 at room temperature, sealing compound "Vickcent Y-1-18" in vulcanized condition has the density within the limits $2.2 \pm 0.05 \text{ g/cm}^2$ and brittle temperature not less than minus 65°C.

Sealing compound "Vickcent Y-1-18" is used with sub-layer. In the form of sub-layer providing adhesion of sealing compound to the surface of articles to be sealed, sublayer $\Pi-90$ (hot drying sublayer) or $\Pi-11$ together with ^{wiping paste No. 24 cold drying} sublayer of cold drying $\Pi-9$ are used. (Sublayer) & $\Pi-11$ together with

For example the product is written for its order as follows: Sealing compound "Vickcent Y-1-18" as per TY 38-103920-78.

a) Sealing compound "Vickcent Y-1-18".

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1. Technical requirements

1.1. Sealing paste Y-1 should be manufactured as per manufacturing regulation, approved in a set order.

1.2. Sealing paste Y-1 should comply with the requirements, specified in table 1.

Table 1

Description of index	Norm
1. Appearance	White paste of uniform consistency without foreign inclusions. During long term storage, insignificant separation of polymer, which is spread during mixing is allowed.
2. Nominal viscosity as per viscosimeter B3-1 (nozzle with diameter 5.4MM) with the limits	8-20 0,5-6,0
3. Working life of paste Y-1 mixed with catalyst No. 18,4, with the limits	

Note: As per agreement with consumer delivery of paste Y-1 with increased nominal viscosity is allowed.

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1.3. The catalyst No.18 should comply with the requirements of TY 6-02-805-78.

1.4. Sublayer Π -11 should comply with the requirements of TY 38-103174-73, sublayer Π -90 should comply with the requirements of TY 38-103175-73.

1.5. Sealing compound "Vickcent Y-1-18" in vulcanized condition should comply with the requirements and norms, specified in table 2.

Table 2

Description of index	Norms	
	Vickcent Y-1-18HT	Vickcent Y-1-18
1. Nominal strength at rupture: MPa(kgf/cm ²), min.	2,25(23)	1,96(20)
2. Relative elongation at rupture, %, min.	120	160
3. Shore hardness A, units within the limits	50-60	50-60
4. Sealing compound-to-metal bond strength (adhesion) at peeling from aluminum alloy $\Delta 16$ during application of sublayer -90 or -11 (rupture along the material or peeling along the gauze), KN/M (kgf/cm), min	1,27(1,3)	1,27 (1,3)
5. Specific volume electrical resistance at temperature 100°C after 2 hours of warm-up at this temperature, ohm cm, min	1.10 ¹²	1.10 ¹²
6. Specific volume electrical resistance at temperature 20±5°C and relative air humidity 65±5°C, ohm/cm, min.	1.10 ¹³	1.10 ¹³
7. Electric strength at temperature 20±5°C and relative air humidity 65±5% KV/MM., min.	5	5

Peeling of sealing compound from metal surface is not allowed.

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Note: For aircraft industry only sealing compound "Vickcent Y-1-18" is supplied.

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1.6. Sealing paste Y-1 is packed in metallic container with a capacity not exceeding 40 litres. (Aluminium, from tin-plate, galvanized iron, sheet steel) with compactly closed covers, protecting from fall of moisture and other foreign objects.

1.7. Completeness of sets.

1.7.1. Sealing compound "Vickcent Y-1-18" is supplied as separate components in the following ratio:

Paste Y-1 ---- 100 kg.
Catalyst No.18 - 0.5kg.
Sublayer П-11 or
sublayer П-90-7.5 kg.

1.7.2. Making up a set of sealing compound with one or other sublayer is carried out as per agreement of manufacturing factory and consumer. Determination of index of adhesion is carried out in compliance with making up of set.

1.7.3. As per the requirements of consumer the quantity of sub-layer П-90 or П-11, entering into set can be decreased or increased, which should be specified in order.

1.7.4. Each batch of paste Y-1, in the set with catalyst No.18 and sublayer П-11 or П-90 is accompanied with a certificate, in in which trade mark of manufacturing factory, name and grade of product, No. of batch, manufacturing date, Net weight, No. of present technical specifications, quantity of packages in the batch, results of tests of sealing compound in compliance with the requirements of present technical specifications or confirmation of compliance of sealing compound with the requirements of present technical specifications as per guarantee index, mode of vulcanization and amount of components, on which property index was determined, TID stamp.

1.8. Marking.

On each package with paste Y-1 the label with specification of name of manufacturing factory or its trade mark, grade of material, X No. of batch and package, manufacturing date, Net weight, No. of present technical specifications, TID stamp

should be stuck.

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Each batch is sealed by TTD of manufacturing factory.
Packing of paste Y-1 in the drums without the seal is allowed.
Marking should comply with the requirements of GOST 14192-77.

1.9. Packing.

Marking of catalyst No.18, sublayers П-11 and П-90 should comply with the requirements of effective technical specification.

2. Rule of acceptance

2.1. Sealing compound "Vickcent Y-1-18" is submitted for acceptance in batches. Quantity of paste Y-1 with weight not exceeding 3000 kg obtained from one or several operations, manufactured from one and the same batch of polymer and filler, in the set with one and the same batch of catalyst No.18 and sublayer П-90 or П-11 is considered as a batch.

During formation of enlarged batch of sealing compound from the paste out of several operations, their difference in nominal viscosity may be not more than 4 seconds.

Manufacturing factory guarantees the compliance of all indices of batch of sealing compound, forming enlarged batch, with the requirements of present technical specifications.

2.2. During acceptance inspection, each batch of sealing compound "Vickcent Y-1-18" is subjected to approval tests as per indices, specified in table 1 and indices 1,2,3,4 of table 2.

Indices ,7 of table 2 are checked only as per requirement of consu . During the test of other batches, norms as per these indices are guaranteed by manufacturing factory without ~~conducting~~ conducting the tests.

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2.3. The consumer has the right to carry out incoming control as per all indices, specified in section 1. The consumer during the manufacture of master standards should be guided by the amount of components and mode of vulcanization specified in accompanied certificate.

2.4. Type tests should be carried out for compliance with all the requirements of present technical specifications in case of change in manufacturing process of preparation of product, and also in case of replacement of source materials.

2.5. In case ~~at~~ ^{of} attainment of unsatisfactory results for any of the indices, the test for given index is repeated on doubled number of samples newly selected from thoroughly mixed paste Y-1 and catalyst No.18. The results of repeated test is considered as final.

3. Methods of tests

3.1. Rules of selection of samples.

3.1.1. For testing the quality of product by the ~~customer~~ consumer in order to meet the requirements of technical specifications, the rules of sample selection and method of test should be followed, which is specified below.

3.1.2. Selection of samples of paste Y-1 for checking of sealing compound for its compliance with technical requirements is carried out from not less than 80% of packed units of batch. The weight of sample should not be less than one kg.

During the inspection of enlarge batch samples are selected from each small batch entering into the enlarge batch, also from not less than 80% of packed units. The weight of total samples should not exceed one kg.

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3.2. Determination of appearance

3.2.1. Equipments to be used are as follows:

Metallic or glass plate with smooth surface.

Metallic or porcelain spatula.

3.2.2. Conduct of test.

Appearance of paste Y-1 is determined visually, by rubbing the paste sample on the plate with the help of spatula.

3.3. Determination of nominal viscosity of paste Y-1.

3.3.1. Equipments and reagents to be used are as follows:

Bottle or jar with tightly closed cover;

Viscosimeter B3-1 with diameter of nozzle 5.4MM as per GOST 9070-75;

Benzine as per GOST 443-76.

3.3.2. Conduct of test.

100 gram paste Y-1 is put in a jar with tightly closed plug, 66 gram benzine is added. The jar is covered and contents are thoroughly mixed till uniform mass is obtained. Subsequent test is conducted as per GOST 8420-74 in a viscometer at $20 \pm 0.5^{\circ}\text{C}$ temperature. Mean arithemetical value of 3 determinations which are carried out in sequence is used as viscosity index.

3.4. Determination of working life of sealing compound "Vickcent Y-1-18".

3.4.1. Equipments and reagents to be used are as follows:

Procelain or metallic crucible as per GOST 2147-73.

Procelain or metallic spatula;

Metallic or glass plate with smooth surface;

As per GOST 443-76;

As per GOST 2603-71;

Catalyst No.18 as per TY 6-02-805-78.

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3.4.2. Conduct of test.

100 parts of paste Y-1 and 0.33 and 0.50 parts by mass of catalyst No.18 are thoroughly stirred by spatula in procelain or metallic crucible for 5-7 minutes till uniform mass is obtained. Then this mass is applied by spatula on smooth metallic or glass plate, preliminarily degreased by benzine or acetone, with a layer of thickness about 2MM and is kept at room temperature.

Working life is determined by the time, in which paste Y-1 mixed with catalyst No.18, loses the capability to be spread by spatula and to stick to metal surface, during this process rubbery condition is obtained.

Note: 1. Before taking the catalyst No.18 for weighing it is thoroughly mixed in closed bottle.

2. Depending upon premises temperature and necessity of increase or decrease of working life of sealing compound within the limits of 0.5 to 6.0+, the quantity of catalyst No.18 may vary during the application within the limits of 0.25 to 0.50 part by weight of paste Y-1.

3.5. Determination of nominal strength at rupture and relative elongation at rupture $\alpha\alpha$ of sealing compound "Vickcent Y-1-18".
Manufacture of samples, determination of nominal strength and relative elongation and results work out are carried out as per GOST 21751-76 on the samples of type 1, with the following additions:

Provided mould for manufacture of samples is filled (by spatula) with sealing compound, obtained as specified in item 3.4 in such a way that level of upper surface of template is completely covered with sealing compound. Template, which is filled with sealing compound, is covered with metallic plate and placed under press. Holding of plates in template or die applying cellophane as per GOST 7130-74 is allowed. Molding is carried out for 4 hours at room temperature and at unit pressure 2.5-3.5MPa. Then the pressure is removed and plates in the mold are kept for 24 hours. ~~XXXXXX~~

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Thereafter the plates are taken out from the mold and kept for 48 hours in ~~the~~ air (total holding time is 74 hours). In case of obtaining the results of test, complying to the norms of technical requirements of present technical specifications, holding time of samples in ~~the~~ air for 24-48 hours is allowed.

Samples for tests should have the form of spades of type 1, with thickness $2 \pm 0.2\text{MM}$.

3.6. Test of shore hardness A. Test of shore hardness A is carried out as per GOST 213-75 on the plates, manufactured as per item 3.5 before cutting of samples from them.

3.7. Test of sealing compound-to-metal bond strength at peeling.

3.7.1. Equipments and reagents to be used are as follows:

Plates made of anode aluminium alloy of grade Δ -16 as per GOST 21631-76;

Benzine as per GOST 443-76;

Acetone as per GOST 2503-71 sublayer Π -11 as per TY 38-103124-73 or Π -90 as per TY 38-103175-73; paste No.2 or sublayer Π -9, when operating with sublayer Π -11.

3.7.2. Conduct of tests.

Test of bond strength of sealing compound to metal, preparation of samples for test and results work-out are carried out as per GOST 21981-76 with the following additions:

Plates made of aluminium anode alloys Δ -16 with filling of anode film with bichromate are degreased and cleared of dust and contaminant with a cloth; which is wetted with benzine. The surface of plates is dried in air for 5-10 minutes and rubbed with the cloth, which is wetted with acetone and again dried for 5-10 minutes. During application of sublayer Π -11 surface of plates is rubbed manually with limited force of paste No.2, which is laid over the cloth.

Paste No.2 is prepared by the mixture in procelain ~~boiler~~ at room temperature of 100 parts by weight of water-repellent liquid 136-41 as per GOST 10834-76 and ~~100~~ parts by weight of

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anhydrous aluminium oxide.

Residue of paste are removed from the surface of plates with rubbing material. On this prepared surface of plates uniform layer of sublayer П-11 is applied with a clean brush. The applied sublayer is dried at temperature 15-30°C for 30-40 minutes.

(before application of sublayer П-11

While using the sublayer П-9 the uniform layer of sublayer П-9 is applied with a clean brush on the surface of plates which is not treated with paste No.2 and is dried at temperature 15-30°C for one hour. Then sublayer П-11 is applied with another brush.

Sublayer П-9 is prepared to location by way of mixing ПБТ (polybutyl^enitrite) and white spirit as per GOST 3134-52 in the ratio:

2 parts by weight of ПБТ (when recounted into 100% polybutyl^enitrite) and 98 parts by weight of white spirit. Before application, the white spirit is to be dried with calcined calcium chloride for 3 days, thereafter filtered through filter paper.

Calcium chloride is taken at a rate of 10% from white spirit. The sublayer П-9 should be stored in the premises for storage of inflammable materials at a temperature from 0°C to 25°C. Guarantee period of storage of sublayer П-9 is 1 month. While testing the adhesion through sublayer П-90 a thin uniform layer of sublayer П-90 is applied on degreased surface by a clean brush and is dried for 30-40 minutes at 15-30°C temperature. Then the samples with applied sublayer П-90 are subjected to heat treatment at 150°C temperature for one hour.

After application and fixation of ~~XXXX~~ sublayer on the surface of plates, sealing compound is applied by spatula with uniform layer of thickness 2-2.5MM which is prepared as stated in item 3.5.

Subsequent preparations and tests of samples are carried out as per GOST 21981-76 by using the iron sieve No.07 or No. 09 as per GOST 3826-66.

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Holding time of prepared samples should be not less than 7 hours at room temperature.

Holding of samples in air for 3⁴/₈ hours is allowed. When results of the tests complying^{to} the norms of ~~these~~ technical requirements of these technical specifications are obtained.

3. Mean arithemathical value from the data, obtained from three determinations is used as the result of tests of all indices of each batch of sealing compound "Vickcent Y-1-18."

3.8. Determination of dielectric indices of properties (items 5, 6, 7) of table 3. Samples for tests are cut out from plates, obtained as per item 3.5. The samples have the shape of a disk with diameter 10MM, thickness 2MM, at determination of specific adjustable electrical resistance they should be folded upto thickness 4MM or pressed upto required thickness of casting one and multicavity mould as per the mode, specified in item 3.5 - for determination^{of} electric strength.

4. Transportation and storage

4.1. Sealing paste Y-1 and other ingredients may be transported in all types of transport.

4.2. Sealing compound should be stored in ware house conditions at temperature from 0 to plus 30°C.

4.3. Conditions of transportation and storage of sublayer π -11 and π -90, catalyst No.18 should comply with the requirements of TY 38 103124-78, TY 38 103175-73 and TY 6-02-805-78 respectively.

5. Guarantee of manufacturer

5.1. Sealing compound "Vickcent Y-1-18" should be accepted by quality control of manufacturing factory.

The manufacturer guarantees the compliance of sealing compound with the requirements of these technical specifications, if, the conditions of application, transportation and storage set by technical specifications are observed by the consumer.

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5.2. Guarantee period, when paste Y-1 is stored, is one month from the day of manufacture.

After expiry of guarantee period of storage the paste Y-1 may be used for the purpose only after its preliminary test for its compliance with the requirements of these technical specifications.

5.3. Guarantee period for storage of sealing compound "Vickcent Y-1-18" in vulcanized condition is 10 years. Guarantee period of sealing compound in articles is set by consumer-factory.

5.4. The consumer has the right to use the ingredients from different batches (pastes, catalyst and sublayers) for the purpose only after preliminary test for their compliance with the requirements of these technical specifications.

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