

STATE STANDARD, USSR

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I-4036

PUTTIES

GOST 10277-76

Official Publication



(22)

All-Union Committee on Standards at the Council
of Ministers of the USSR

MOSCOW

GOST

10277-76

PUTTIES

Supersedes

GOST 10277-62 and

GOST 5.2280

Approved by All-Union Committee on Standards at the Council of Ministers of the USSR on February 1976, No.380. Effective:

since January 1977

until January 1982

NON-OBSERVANCE OF STANDARD IS PROSECUTED BY LAW

The present Standard relates to putties which are, actually, dense viscous masses consisting of a mixture of pigments and fillers in the binder. Putties are designed to fill roughnesses and remedy painted surface defects. Putties are also used for the systems of coatings operated under atmospheric conditions as well as inside premises.

Putties are applied to the surface by means of a spatule or a paint sprayer.

1. TYPES AND TECHNICAL REQUIREMENTS

- 1.1. Depending on the mix formulation and the purpose of putties the latter are manufactured of the grades in compliance with Table 1.

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REPRODUCTION PROHIBITED

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Table 1

Grade	Composition	Purpose
B-002 of red-brown color	Mixture of pigments, fillers and varnish (pentagthalic and oil) corresponding to the grade of putty with/out introduction of additives (organic solvent, siccative, etc.)	For levelling and remedy of faults in ground-coated metallic and wooden surfaces as well as for smoothing the enamel layer
B-C04, green	Mixture of pigments, fillers and solution of polyvinyl-chloride chlorinated resin in organic solvents with addition of plasticizer.	For levelling and remedy of faults in ground-coated metallic and wooden surfaces as well as for smoothing the enamel layer.
B-C05, grey		
III-C07, red-brown color	Mixture of pigments, fillers and solution of colloxylin in organic solvents with addition of plasticizer and oils	For levelling and remedy of faults in ground-coated metallic and wooden surfaces as well as for smoothing the enamel layer
III-C006, rose color	Mixture of pigments, fillers and alkyd-styrol varnish	For remedy of minor defects on ground-coated surface as well as on the sur-

Table 1 (continued)

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Grade	Composition	Purpose
		faces which are ground-coated and enamelled
SH-0010, red-brown color	Mixture of putty paste being, actually, a mixture of pigments, fillers and solution of epoxide resin in organic solvents with addition of plasticizers, with hardener No.1 which is 50% solution of hexamethylenediamine in ethyl alcohol	For levelling ground-coated and ungrounded metallic and non-metallic surfaces as well as for application as ground coats in epoxide materials. Besides, putty SH-0020 can be used to level and protect special ceramic surfaces with a maximum humidity of 6.5% from being attacked by moisture
SH-0020, red-brown color		

2. Putties should be manufactured in compliance with the requirements of the present Standard as well as in compliance with the mix formulations and technological standards approved in a prescribed order.

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3. Putties of grades 3H-0010 and 3H-0020 are manufactured in the form of two half-finished products, and namely, putty paste and hardener No.1 both being jointly supplied to the Customer.
4. Prior to putting into use of putties of grades 3H-0010 and 3H-0020 it is necessary to introduce hardener No.1 into the putty paste at the rate of 8.5 parts of hardener per 100 parts of the putty paste (according to the mass).
5. For applying putties by means of paint sprayers they will be diluted till the working viscosity with the help of solvents of the following grades:
 - (a) H0-002 and K0-003 - white spirit according to GOST 3134-52*, turpentine according to GOST 1571-76 or mixture of white spirit with solvent according to GOST 1928-67 or GOST 10214-62 in the ratio of 1:1;
 - (b) MC-006 - xylene according to GOST 9410-71 or GOST 9949-76;
 - (c) HH-007 and HH-008 - solvents 645 or 646 according to GOST 18188-72;
 - (d) XB-004, XB-005, 3H-0010 and 3H-0020 - solvent P-4 or P-5 according to GOST 7827-74
6. Putties should meet the requirements and standards set forth in Table 2.

2. ACCEPTANCE RULES

- 2.1. For the acceptance rules a reference should be made to GOST 9980-75, Division 1.

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Accepted to be a lot of putties of grades 3H-0010 and 3H-0020 is a total amount of the putty paste homogenous in its qualitative characteristics and obtained during a single technological cycle as well as an amount of hardener No.1 required thereto. The lot is supplied with a single document to certify the quality of the putty. The total weight of the putty paste in a lot should not exceed 3.5 tons.

- 2.2. The Manufacturer should check periodically (by taking samples from every 10th lot) the viability characteristic of putties of grades 3H-0010 and 3H-0020.

3. TEST METHODS

- 3.1. Samples should be taken according to GOST 9980-75, Division 2. Prior to testing the samples should be allowed to stay inside premises for the air bubbles to leave the samples.

3.2. Preparation of Samples for Testing

The bending strength of the putty layer should be determined on sheet steel plates of size 70 x 170 mm and thickness 0.25 to 0.28 according to GOST 1127-72.

Water absorption characteristic should be determined on aluminium plates according to GOST 21631-76 or GOST 13726-68 of size 50 x 50 mm and thickness 0.2 to 0.3 mm. Other characteristics should be determined on plates made of steel of grades 08 KH and 08 HC according to GOST 16523-70 of size 70 x 150 mm and thickness of 0.8 to 0.9 mm. The plates for applying putties thereto are prepared in accordance with GOST 8832-76, Division 3.

Non-ground plates should be used for applying putties of

Standards for putties of grades:

Name of
parameterH3-002
red-brown
colorK3-003
red colorMC-006
rose colorXB-004
green colorXB-005
grey colorH4-007
red-brown
colorH4-008
khaki and
grey color3H-0010
red-brown
color3H-0020
red-brown
colorTest
methods.

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3

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1. Appearance
of puttying
layer after
dryingPuttied sur-
face should
be smooth
without scr-
atches, ca-
vities, cr-
acks and
occlusionsPuttied surface should be
smooth, uniform, without ca-
vities, cracks and occlusionsPuttied surface
should be smooth
uniform, without
cavities, cracks
granules of un-
ground pigment
and occlusionsAccording to step 3.3 of
the present Standard2. Viscosity
of putty dis-
solved in
solvent at
20°C, cStAccording to GOST 8420-74
and step 3.4 of the pre-
sent Standard

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	1	2	3	4	5	6	7	8	9	10	11
(a) by viscosi-											
meter B3-1											
(nozzle -											
5.4 mm)	-	-	-	-	50-100	35-60	50-120	50-120	-	-	-
(b) by viscosi-											
meter B3-4	-	-	-	-	not less than 19	-	-	-	30-50	35-55	-
Penetration at											
20°C, degr	not fixed	-	-	-	-	-	-	-	-	-	-
Putty runoff											
from vertical											
surface	none	-	-	-	-	-	-	-	-	-	-

According to
GOST 5346-50*

According to
step 3.5 of the
present Standard

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1 2 3 4 5 6 7 8 9 10 11

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(9)

Content of non-volatile substances, %, not less than	75	75	80	60	67	65	70	90	92	According to GOST 17537-72 and to step 3.6 of the present Standard
Rate of wear by friction, um, not more than	90	100	75	90	80	75	90	-	-	According to GOST 6589-74 and to step 3.7 of the present Standard
Drying time, hr, not more than:										According to GOST 19007-73
UP TO DEGREE 3:										
(a) at 20 ± 2°C	24	-	0.25	2	2.5	1	2.5	-	-	
(b) at 80 to 85°C	1	-	-	-	-	-	-	-	-	
(c) at 100 to 105°C	-	1	-	-	-	-	-	-	-	

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1	2	3	4	5	6	7	8	9	10	11
UP TO GRADE 4:										10277-76 10
(a) at 20 ± 2°C	-	-	-	-	-	-	-	24	24	
(b) at 65 to 70°C	-	-	-	-	-	-	-	7	7	

Grinding ability	Putty should be ground with the help of watertight grinding cloth No. 4 to 6 with water									According to step 3.8. of the present Standard
Grinding ability, g, not more than	Not regulated									According to GOST 21473-76, method "A" by wetting with water
Strength of puttying layer during bending, mm, not more than	100	100	100	50	50	50	50	50	50	According to step 3.9. of the present Standard
Strength of puttying layer during impact, kgf/cm, not less than	20	-	50	30	30	20	20	50	50	According to GOST 4765-73 and to step 3.10. of the present Standard

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1A

2. Water absorption of base layer film, %, not more than

0.8 According to GOST 21513-76

3. Liability at 20 ± 2°C, g, not less than:

(a) when applied by spatule
(b) when applied by paint sprayer

According to step 3.11 of the present Standard
1.5 1.5
6 6

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Dye

- NOTES:
1. Characteristics of steps 3 and 9 of Table 2 will not be standardized until July 1, 1978.
Non-standardized characteristics are to be necessarily determined and the obtained values thereof should be entered in the respective quality certificates.
 2. The standards according to steps 4 and 8 of Table 2 will be valid until July 1, 1978.
 3. After the putties of grades 3H-0010 and 3H-0020 are tested according to step 11 of Table 2 the puttying layer will be allowed to contain a surface hair net observed clearly without application of magnifying glass.
 4. Viscosity of putties of grades HH-007 and HH-008 is allowed to be less than the specified value in the event if the putties meet all requirements of the present Standard.

grades 3H-0010 and 3H-0020. For applying putties of all other grades it is necessary to use plates primed preliminarily with ground coat (grades P-020 according to GOST 4056-63*, H-020 according to GOST 18186-72, P-032 FC and other interchangeable ground coats). Ground-coated surface after drying should be treated with a grinding cloth of fineness 4 to 6 according to GOST 6456-75 or GOST 10054-75. Should there be any disagree-

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ment between the Supplier and the customer in the estimate of of the quality of the putties, ground coat of grade P-020 will be employed.

Characteristics of viscosity and the content of non-volatile substances should be checked in the putty paste containing no hardener (for putties of grades 3H-0010 and 3H-00). The puttying paste mixed with the hardener should be withstood for 15 to 20 min before it is applied to the plates.

Use a spatula to apply putties (except for the putty of grade MC-006) to the prepared plates by means of a special device in which case act as follows: apply putties of grades B-002, K-003, 3H-0010 and 3H-0020 by means of a pattern having a thickness of 0.5 mm. In this case the thickness of the puttying layer after drying should not be more than 400 μ m for the putties of grades B-002, K-003 and 350 μ m for the putties of grades 3H-0010, 3H-0020. For applying putties of other grades make use of a pattern having a thickness of 0.3 mm. In this case the thickness of the puttying layer after drying should not exceed 150 μ m for the putties of grades XB-004, XB-005 and 120 μ m for the putties of grades HU-007, HU-008.

Apply the putty of grade MC-006 to the plate without application of a pattern. In this case the thickness of the puttying layer after drying should lie within the limits of 40 to 50 μ m.

The device for applying putties (drawings 1 to 4) consists

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of a steel plate and four clamps with backing-up wing nuts attached thereto, a holding steel frame and metallic patterns of different thickness. The surfaces of the plate and the frame should be ground. Clamp tightly the prepared steel plate between the plate and the pattern by means of the frame and the backing-up wing nuts following which apply putty thereto abundantly up to the edges of the pattern using for the purpose a metallic spatula. Remove the surplus of putty as may be required.

The size of the pattern cut should be 50 x 130 mm.

Dry the putty at the temperature and for the time period stated under step 7 of Table 2. Prior to a hot drying withstand the plate with the putty applied thereto at the temperature of $20 \pm 2^{\circ}\text{C}$ and a relative air humidity of 60 to 70% for 3 hours in the case of the putties of grade H-002, for 4 hours in the case of the putty of grade K-003 and for 1 hour in the case of the putty of grades 3H-0010 and 3H-0020.

After a hot drying cool the coating down to the temperature of $20 \pm 2^{\circ}\text{C}$.

Should there be any disagreement between the Supplier and the Customer in the estimate of the quality of putties of grades 3H-0010, 3H-0020 and H-002, drying will be conducted at the temperature of $20 \pm 2^{\circ}\text{C}$ for 24 hours.

For determination of the bending strength of the puttying layer, the putty of grade H-002 should be dried at the temperature of $20 \pm 2^{\circ}\text{C}$ only. After drying treat the putties of

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Device to apply putties

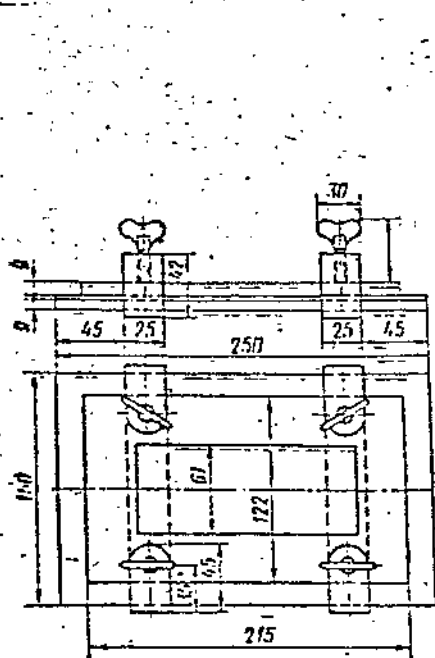


Fig. 1

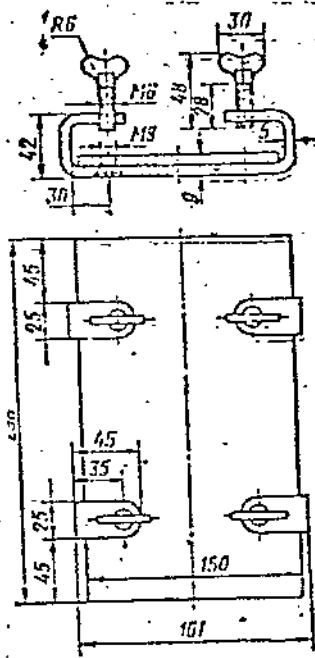


Fig. 2

S = from 0.5 to 1.1

s = on 0.5 on 1/1

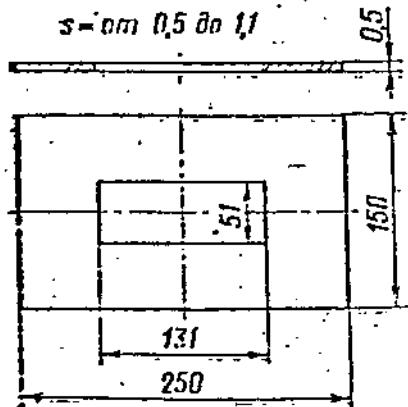


Fig. 3

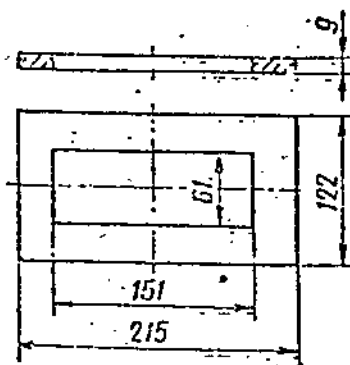


Fig. 4

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grades II-002 and K-003 with a grinding cloth of fineness 4 to 6 according to GOST 10054-75 by wetting it continuously with water following which withstand the putties in the air at the temperature of $20 \pm 2^{\circ}\text{C}$ for 1 hour. After drying keep the putty of grade MC-006 inside a thermostat at a temperature of 90 to 100°C for 2 hours. Thereupon, take the plate out of the thermostat and cool it in the air for 30 min.

Prior to determination of the bending and the impact strengths of the puttying layer place the putties of grades XB-004, XB-005, HH-007 and HH-008 after drying thereof into a thermostat and keep them therein at a temperature of 65 to 70°C for 2 hours. Thereupon, take the plate out of the thermostat and cool it in the air for 30 min.

- 3.3. Check visually the appearance of the puttying layer after its drying by examining the surface of the layer before and after grinding in the diffused daylight.

Treat the layer with grinding cloth (without use of water of fineness 4 to 6 according to GOST 6456-75 or GOST 10054-75).

- 3.4. Determine the viscosity of putties in compliance with GOST 8420-74. Prior to determination of viscosity dilute putties with solvents. Dilute putties of grades XB-004, XB-005, HH-007 and HH-008 with acetone (GOST 2768-69) and putties of grades 3H-0010 and 3H-0020 - with toluene (GOST 9880-76 or GOST 14710-69) in the ratio of 4 weight parts of putty and 1 weight part of solvent. Dilute putty MC-006 with xylene (GOST 9410-71 or GOST 9949-76) in the ratio of 5 weight parts of putty and 1 weight part of solvent.

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3.5. Runoff of putty from the vertical surface should be determined visually. To this end place the plate with the putty applied thereto in the vertical position (over the length of the plate) and withstand it at the temperature of $20 \pm 2^{\circ}\text{C}$ and a relative air humidity of 60 to 70% for 0.5 hour. In this case no runoff of putty should take place.

3.6. Determine the content of non-volatile substances according to GOST 17537-72.

Carry out heating at the following temperatures:

(a) at the temperature of $140 \pm 2^{\circ}\text{C}$ for putties of grades ПЭ-002, КЭ-003 and МС-006;

(b) at the temperature of $105 \pm 2^{\circ}\text{C}$ for putties of grades ХВ-004, ХВ-005, НН-007 and НН-008;

(c) at the temperature of $120 \pm 2^{\circ}\text{C}$ for putties of grades ЭН-0010 and ЭН-0020

3.7. Determine the rate of wear by friction in compliance with GOST 6589-74 using for the purpose a wedge having a measurement range of 0 to 150 μm .

3.8. Grinding Ability

After drying up of the puttied surface it should be ground by means of a grinding cloth of fineness 4 to 6 according to GOST 5009-75 or GOST 10054-75. Grinding should be effected uniformly over the entire surface by wetting it regularly with water. As soon as the surface is ground it will be washed with water and wiped dry with a soft cloth.

Puttied surface will be considered to be in compliance with the present Standard if it fails to get soaked in the

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course of its grinding for 15 min, if a smooth dull surface is obtained and if no flanged edges are evident at the areas ground up to the first coat layer or to the base layer.

- 3.9. Determine bending strength of the puttied layer by means of a device used for determination of elasticity of putties (Fig.5).

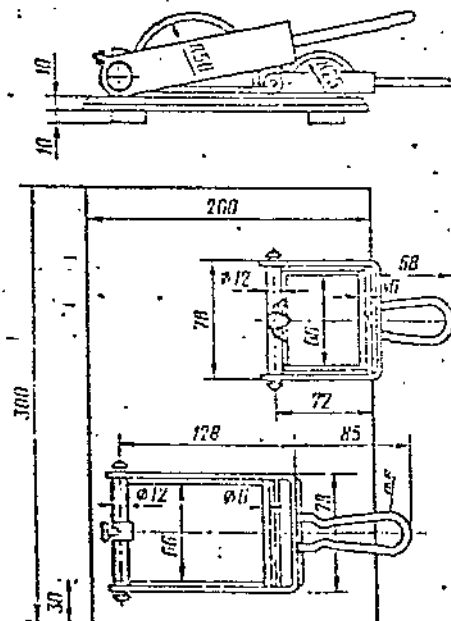


Fig. 5

The device consists of a metallic plate with semi-cylinders of diameters 100 mm and 50 mm attached thereto, a movable frame with a pressing roller designed to press the plate to the cylindrical surface, a fastening screw and a wooden support.

Secure one end of the plate with the putty applied there- to on the device by means of the fastening screw; with the frame having been lowered to the horizontal position press it by means of the roller to the cylindrical surface.

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Consider the putty to be in compliance with the requirements of the present Standard if in the course of bending over the half-cylinder with a diameter of 100 mm or 50 mm no cracks are formed on the puttied surface that can be observed by naked eye.

Cracks at a distance of up to 15 cm from the edges of the puttied layer should not be taken into account.

3.10. Determine the impact strength of the puttied layer according to GOST 4765-73. Use for the purpose device Y-2 for putties of grades 3H-0010, 3H-0020 and device Y-1a for other grades of putties.

3.11. Determine viability of putties of grades 3H-0010 and 3H-0020.

3.11.1. For determination of viability of putties applied by means of a spatula, take 100 g of putty paste, add 8.5 g of hardener No.1, stir thoroughly the mixture until a homogenous mass is obtained and endure the mixture at the temperature of $20 \pm 2^{\circ}\text{C}$ for 1.5 hours.

Consider the putty to be in conformity with the requirements of the present Standard if upon expiration of the prescribed time interval it can easily be applied by a spatula to a surface (without rolling up under the spatula).

3.11.2. For determination of viability of the putties applied by means of a paint sprayer take 150 g of putty paste, add 12.75 g of hardener No.1, stir thoroughly the mixture until a homogenous compound is obtained, dilute the mixture till a viscosity of 18 to 20 cSt by one of the solvents pointed out in step 1.5.

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at the temperature of 20°C and endure it at the temperature of 20 ± 2°C for 6 hours. Thereupon, stir thoroughly the mixture and again measure the viscosity at the temperature of 20°C.

NOTE: Measure the viscosity by means of viscosimeter B3-4.

Consider the putty to be in compliance with the requirements of the present Standard if upon termination of the prescribed time-term the viscosity does not exceed 40 cSt.

4. PACKING, MARKING, TRANSPORTATION AND STORAGE

4.1. Patties of grades 3H-0010 and 3H-0020 are to be shipped to the Customer in the form of two individually-packed half-finished products containing the putty compound and hardener No.1.

4.2. Pack the putties according to GOST 9980-75 using for the purpose wide-necked metallic drums in addition to wooden drums and barrels.

Pack hardener No.1 in compliance with GOST 9980-75

Pack putty compounds into steel flasks according to GOST 5799-69.

By agreement between the Supplier and the Customer metallic and polyethylene jars designed for commercial needs can be packed into cardboard boxes.

3. Marking, transportation and storage of putties should be effected in accordance with GOST 9980-75.

5. GUARANTEE

1. The Manufacturer should guarantee the conformity of the putties with the requirements of the present Standard provided the conditions of transportation and storage prescribed by the present

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Standard are strictly observed.

6.2. Guaranteed term of storage of putties (except for epoxide putties) is six months since the date of their manufacture.

Guaranteed storage term of epoxide putty compound and hardener No.1 is 12 months since the date of their manufacture.

Upon expiration of the guaranteed storage term the putties before putting into use should be checked for conformity with the requirements of the present Standard.

6. SAFETY PRECAUTIONS

6.1. Putties are considered to be toxic and fire-hazardous materials this being stipulated by the properties of the solvents comprised into their composition and employed for their dilution (Refer to Table 3) as well as by the toxic component (hexamethylenediamide) comprised in the composition of the putties of grades 3H-0010 and 3H-0020.

Table 3

Grade	Name of solvent	Maximum permissible concentration in the air of working zone of premises, mg/m ³	Temperature, °C		Explosive limit in mixture with air (in volume)
			flash	self-ignition	
	2	3	4	5	6
1-002 and 1-003	White spirit	300	33	260	1.4 - 6.0
	Turpentine	300	34	300	0.8
	Solvent	100	34	520	1.0 - 3.8
1-0010 and 1-0020	Xylene	50	17 to 29	553 to 618	1.0 - 7.6
1-006					
1-005					

2. Maximum permissible concentration of hexamethylenediamine is 1 mg/m^3 .
3. In the course of manufacture, application and testing of putties it is necessary to follow strictly the rules of industrial sanitation and the fire safety regulations.
4. All operations requiring manufacture and application of putties should be performed inside shops provided with suction-and-exhaust ventilation and fire-fighting means.
5. The personnel in charge of manufacture and application of putties should be provided with individual means of protection.
6. Fire fighting means should include sand, felting, fire extinguishers of type ON-05 and foam fire extinguishers.

RANGE:

GOST 1571-76 supersedes GOST 1571-66

GOST 9880-76 supersedes GOST 9880-61

GOST 21631-76 supersedes GOST 13722-68