Scientific Production Company "Doza", Ltd

Approved
FVKM.04.001.0011-151-LU

Laser Printer
SP 230DNw

Instructions
on storage, preservation routine
and represervation terms and conditions

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Contents

These instructions specify general requirements for product preservation that provides corrosion protection when the products are being transported and stored in countries tropical climate, as well as for depreservation and represervation of the products. These instructions contain information about packing of the preserved products.

1 GENERAL PROVISIONS

1.1 A preservation method given in these instructions provides corrosion protection of the products transported to tropical climate countries.

1.2 The used variant is a temporary anticorrosion protection VZ-10 according to GOST 9.014.

1.3 The preservation method of protection variant VZ-10 is isolation of products from environment using packing materials or sealed case (casing, housing, compartment) of the products with subsequent dehumidification of air in the isolated volume with desiccant (silica gel).

1.4 All materials used for preservation shall meet the requirements of corresponding standards and technical specifications for the used material, have a certificate (passport). The list of materials used for preservation is given in article 2.

1.5 The products preserved by the described herein method shall be in the package that complies with storage conditions 1(L) according to GOST 15150. Conditions of transportation in package shall comply with storage conditions 1(L) according to GOST 15150.

1.5.1 General requirements to package shall meet GOST 23170 category KU-2 or KU-3.

1.5.2 Preservation and packing of equipment shall meet GOST 24634, GOST 5959, design documentation, packing drawing and package specifications, as well as GOST 9.014 for group III, protection variant VZ-10, package variant VU-5.

1.5.3 Product preservation and depreservation shall be carried out when the presence of corrosion-active agents in room atmosphere corresponds to atmosphere type I according to GOST 15150.

Ambient temperature of preservation/depreservation area areas shall be in the range from +5 to +40°C; relative air humidity up to 80 % at +25 °C.

1.6 Equipment preservation procedure shall correspond to article 6 of the instructions, depreservation to article 8, represervation to article 9.

1.7 Before being put in operation, the equipment shall be stored in preserved state indoors of warehouses with natural ventilation. Storage in unheated warehouses without artificial climate control is allowed.

1.8 Storage of equipment without preservation and packing is not allowed.

2 MATERIALS AND MEANS USED FOR PRESERVATION

Materials and means used for preservation are the following:

1. Technical granulated macroporous silica gel of KSKG grade according to GOST 3956.
2. Silica gel indicator according to GOST 8984.

3. Drying cabinet

4. Desiccator without a cock 2-300 according to GOST 25336.

5. Wrapping polyethylene film of M and T grade, thickness 0.15, 0.2, 0.3 mm according to GOST 10354.

6. Foot solder МСП-900.

7. Scales "OHAUS LS500". Capacity range up to 5 kg. Accuracy class II, according to GOST P 53228. Resolution 0.1 g.

8. Technical rectified ethyl alcohol according to GOST P 55878.

9. Wadding, gauze or rags.

10. Nonwoven thermally-bonded polypropylene material Spanbondm, width 175 mm, according to GOST 26464.

11. Scissors.

12. Sealing tape according to GOST 18251, GOST 9438.

13. Vacuum lubrication.

14. Transparent plastic boxes, dimensions – 40×14×50.

Note – As auxiliary materials and equipment for preservation preparation it is allowed to use any means with similar characteristics.

3 SAFETY REGULATIONS

3.1 Development, arrangement and procedures of preservation and depreservation shall comply with the requirements of GOST 12.2.049, GOST 12.2.061 and "Sanitary rules of workflow arrangement and hygienic requirements to production equipment".

3.2 Preservation/depreservation areas shall be isolated from other workflow operations in order to avoid harmful influence on the people not engaged in preservation process (isolation, air curtain etc.)

3.3 Wet cleaning excluding dust and aerosols in work area shall be made in the preservation/ depreservation areas.

3.4 Wastes of preservation means shall be put in close boxes for further utilization.

3.5 Workers engaged in preservation procedure shall pass a safety training for work and fire safety.

3.6 It is not allowed to:

- use inhibited polyethylene film to wrap food, personal items etc.;
- use open fire (torch, welding etc.) at preservation/depreservation areas;
- store and eat meal at preservation/depreservation area.

3.7 In a plain view there shall be a first-aid kit with medicines to provide first aid in emergency.

3.8 The preservation/depreservation areas shall have fire safety means in accordance with the requirements of GOST 12.4.009.

3.9 At the preservation/depreservation areas safety signs in compliance with GOST P 12.4.026 shall be provided.

4 ENVIRONMENTAL PROTECTION REQUIREMENTS

4.1 Preservation and depreservation processes shall not cause environmental pollution exceeding the maximum permissible values as specified by the appropriate standards and other normative documents.

4.2 For preservation under VZ-10 method, inert substances are used, they contain no poisonous, chemically dangerous and toxic substances.

4.3 Hazardous class of wastes caused by preservation and depreservation processes shall be defined in conformity with "Temporary classifier of toxic industrial waste and methodological recommendations on industrial waste toxicity class defining" No. 4286-87 as approved by the Public Health Ministry of Russia.

4.4 Used highly inflammable liquids and cleaning material shall be collected into metal containers and, in set time interval, sent to the points of used materials collection for their following thermally destruction with special equipment having obligatory air cleaning from toxic substances of burning, before emission into atmosphere.

4.5 Sanitary air protection during preservation and depreservation processes shall be performed in accordance with the requirements of GOST 17.2.3.02. The limits of maximum permissible emissions shall be agreed and accepted in due course.

4.6 During preservation and depreservation processes, soil protection against pollution by the used substances shall be ensured according to the requirements of GOST 17.5.1.03.

Polyethylene and silica gel shall be pressed and utilizes in points of industrial waste processing.

4.7 Storage of wastes formed by the preservation and depreservation processes shall meet the requirements of the Sanitary Rules "Toxic industrial waste disposal limit on the territory of the enterprise" No. 3209-85, accepted by the Public Health Ministry of Russia.

5 PREPARATION FOR PRESERVATION OF TECHNICAL COMPONENTS' SURFACES AND MATERIALS

5.1 Preparation of the main technical components of the product

Equipment subject to preservation shall be packed according to the package contents as specified the product passport.

The product shall be packed in one, or more, boxes according to the packing design documentation. Some technical components of the product (TC) shall be preserved and packed in cells of the packing boxes according to the packing drawings.

5.1.1 If necessary, clean the surfaces subject to temporal anti-corrosion protection from contamination, dry them out according to decontamination requirements as specified in the technical specifications of the product.

Surface preparation of some modules of complex TC is not obligatory, in case they are not subject to further processing after assembly according to operation requirements.

5.1.2 Process the surfaces of TC main component that have not been in use before by alcohol wetted wadding, gauze or rags.

5.1.3 Touching TC surfaces after their degreasing by unprotected hands is not allowed.

5.2 Preparation of auxiliary TC and sets

Auxiliary TC and sets are prepared for preservation according to Table 5.1.

Table 5.1

Components of the product to be packed	Processed with ethyl alcohol	Note
Laser Printer SP 230DNw	yes	
Repair documentation	no	

5.3 Preparation of materials for preservation

5.3.1 Prepare fabric mattress with silica gel. Silica gel mass norms required for preservation of one package of TC are given in article 10, taking into consideration the mass of silica gel indicator for preservation according to 6.1.2.

1) Before use, all mass of silica gel for preservation of one pack shall be dried out in the drying cabinet for minimum 3 hours at temperature + (100 ±5) °C. Silica gel shall be cooled down in the drying cabinet down to + 50 °C, hold for 30 min. Remove into the desiccators for cooling down to air temperature. Mass fraction of moisture in silica gel before use shall not exceed 2 %.

2) Prepare fabric cover of silica gel mattresses according to cell dimensions which TC shall be packed in.

3) Silica gel mass for one pack shall be divided by the number of cells in one pack.

4) Silica gel mass in one mattress shall be defined by the formula

$$m_{1mat} = \frac{m_{pack}}{n_c \cdot 6} \quad (5.1)$$

where m_{pack} – silica gel mass in one pack;

n_c – number of cells in one pack;

6 – number of mattresses in one cell.

5) Fill in the fabric covers of mattresses with silica gel. The form of mattresses shall provide the maximum surface-to-volume relation.

5.3.2 Prepare fabric bags to be put in the sets, fill them in with silica gel, 100 g each.

The number of bags is defined by the total mass of silica gel in one pack of sets.

5.3.3 Prepare the bags with silica gel indicator. Use silica gel indicator as humidity indicator according to GOST 8984, blue and purple colors indicate an acceptable relative humidity value, pink shows that represervation of the products is required.

1) Before use, all mass of silica gel indicator for preservation of one pack shall be dried out in the drying cabinet for minimum 3 hours at temperature + (100 ±5) °C. Silica gel indicator shall be cooled down in the drying cabinet down to + 50 °C, hold for 30 min. Remove into the desiccators for cooling down to air temperature.

2) Prepare transparent plastic boxes with holes.

3) Fill the plastic boxes in with silica gel. Keep the filled silica gel indicator in the desiccators before putting into the pack.

The number of boxes with silica gel indicator in one pack shall be defined by the number of TC in one pack.

5.3.4 To manufacture packaging covers prepare two-layer polyethylene film, thickness – 0,15, 0,2 or 0,3 mm, considering instructions of article 10.

5.3.5 Cut F1 and F2 forms of the polyethylene film with scissors according to Appendix B, dimensions of the forms shall correspond to overall dimensions of TC to be packed inside the film.

The width of "sleeve" of two-layer polyethylene film shall be minimum L+100 mm, where L – the TC length, according to the overall drawing of the component being packed.

6 PRESERVATION AND PACKAGING

6.1 Products shall be preserved under the protection variant VZ-10 using silica gel by one of the following ways according to the delivery terms.

6.1.1 Product preservation without silica gel indicator:

1) pack TC by the first layer of F1 film, wrap the cover manually so that the film covers TC tight, seal the joints of the polyethylene film "sleeve" by the sealing tape;

2) fix the silica gel mattresses or bags by the sealing tape on TC according to the packing drawing;

3) pack TC into the cover of F2 polyethylene film;

Note – If twice less silica gel is used, pack TC into the second cover of F2 film.

4) wrap the cover manually;

5) seal the joints of F2 cover;

6) pack the covered TCs, which are to be put in one pack, into the appropriate cells of the veneer box according to the product packing (assembly) drawing.

6.1.2 Product preservation using silica gel indicator:

Articles 1) – 4) perform similar to 6.1.1.

5) put the box with silica gel indicator up to TC in the space between F1 and F2 covers and fix it with the sealing tape;

Note – Bags, mattresses and boxes with silica gel should not touch TC surfaces. In case you cannot avoid it, F1 packing material shall be put under them, according to Appendix B.

6) wrap the cover manually;

7) seal the joints F2 cover;

8) pack the covered TCs, which are to be put in one pack, into the appropriate cells of the veneer box according to the product packing (assembly) drawing.

Note – It is not necessary to use silica gel indicator for preservation by two covers.

The products may be covered on panels, trays, ledgers, pads, which they are fixed with screws or bolts to.

6.2 The period of time from start placing silica gel on TC till the end of last joint sealing shall not exceed 2 hours.

6.3 The polyethylene film covered TC shall not be kept away from light exposure (kept in tare or closed shelves or covered with non-transparent fabric).

6.4 Preservation data shall be recorded in the product passport and registered with the signature of packer.

7 PRESERVATION MONITORING

7.1 Integrity of covers and sealed joints shall be visually inspected. No holes, lack of sealing, swells, foreign inclusions and overburnings are allowed.

7.2 Leakage of sealed joints of the polymer film covers shall be tested according to GOST 12302.

7.3 Condition of the covers shall be checked before storage and then every two months according to GOST 12302.

In case of any ruptures of F2 cover or change of color of silica gel indicator to pink, a TC represervation is required, that is to change silica gel dehydrator and patch the damaged areas of the cover.

7.4 Relative air humidity in the package of product preserved according to 6.1.1 shall be checked one time with humidity indicator or by weighing method (control weight quantity).

8 DEPRESERVATION

8.1 Depreservation of products under the protection variant VZ-10 shall be performed as follows:

1) open the packing box and remove TC out of the box;

2) cut and remove the polyethylene covers;

3) remove mattresses and bags with silica gel dehydrator and boxes with silica gel indicator;

4) cut and remove the inside polyethylene film.

No additional processing before TC operation is required.

8.2 The packing materials shall be put separately.

8.3 The silica gel mattresses and bags shall be stored till represervation.

9 REPRESERVATION

9.1 If any defects of temporal anticorrosion protection are revealed by control inspections during storage or after expiration of protection terms, product shall be represerved.

9.2 The temporal protection variant and inside packing that have been used for preservation shall be applied for represervation.

9.3 The inside packing undamaged in storage and temporal anticorrosion protection means after their protective feature restoration are allowed for represervation.

9.4 In case of VZ-10 preservation variant, the products shall be represerved by partial opening of the inside package and change of dehydrator with subsequent sealing of the inside package.

10 CONSUMPTION OF MATERIAL PER PACKAGE

10.1 The silica gel norms for preservation under the protection variant VZ-10 for tropical climate storage conditions shall correspond to those specified in Table 10.1. Silica gel consumption per unit of product shall correspond to the design documentation.

Table 10.1 – Norms of silica gel laying

Packing film thickness according to GOST 10354, mm	Silica gel surface density, kg/m^2 (per film area)
0.15	4.38
0.2	3.5
0.3	2.45

When double sealed covers of F2 polyethylene film are used for equipment preservation, the surface density of silica gel may be reduced twice in the inside package.

When covers of other packing materials, rubber cloth No.18 etc., are used, the norms of silica gel laying can be changed in comparison with the data given in Table 10.1 proportionally to the relation of vapor permeability of the other packing materials to vapor permeability of polyethylene film.

10.1.1 Silica gel mass for TC packed in one pack is calculated by the formula

$$m_{\text{in 1 pack. sil-g}} = \sum_{i}^{n} (\rho * S_i), \qquad (10.1)$$

where n – the number of packing places in one pack;

p – silica gel surface density, kg/m^2;

S – polyethylene film area for TC.

10.2 Silica gel norm of laying ……..... from 10 to 15 g/m^3.

10.3 Polyethylene film consumption (m) is calculated by the formula

$$L_{\text{pol}} = \sum_{i}^{n} (3H_i + 6S_i + 0{,}25), \qquad (10.2)$$

where H – height of TC according to overall drawings, m;

S – width of TC according to overall drawings, m;

n – number of packing units in one pack.

10.4 Consumption of Spanbond material (m^2) is calculated by the formula

$$S_{Spanbond} \sum_{i}^{n} (2H_i \cdot S_i + 2S_i \cdot L_i + 2H_i \cdot L_i + 1{,}2), \qquad (10.3)$$

where H – height of TC according to overall drawings, m;
S – width of TC according to overall drawings, m;
L – length of TC according to overall drawings, m;
n – number of packing units in one pack.

10.5 Ethyl alcohol consumption ……...……..…… 0,05 l.
10.6 Wadding consumption ……..…..…….. from 2.5 to 3 g.
10.7 Gauze, rags consumption ……..…….. 3 dm^2.
10.8 Sealing tape consumption ……... 5 m.

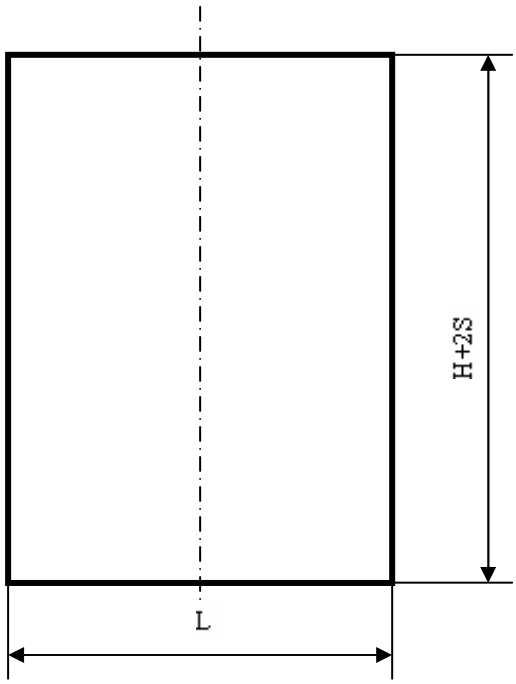
Appendix A
(reference)

LIST OF REFERENCES

Notation	Title
GOST 9.014-78	Unified system of corrosion and aging protection. Temporal anticorrosion protection of products. General requirements
GOST 12.2.049-80	Occupational safety standards system. Industrial equipment. General egronomic requirements
GOST 12.2.061-81	Occupational safety standarts system. Industrial equipment. General safety requirements to working places
GOST 12.4.009-83	Occupational safety standards system. Fire-fighting equipment for protection of units. Basic types. Location and maintenance
GOST 12.4.026-2015	Occupational safety standards system. Safety colours, safety signs and signal marking. Purpose and rules of application. General technical requirements and characteristics. Test methods
GOST 17.2.3.02-2014	Regulations for establishing the permissible limits of harmful pollutants emissions from industrial enterprises
GOST 17.5.1.03-86	Nature protection. Lands. Classification of overburden and enclosing rocks for biological recultivation of lands
GOST 3956-76	Silica gel for industrial use. Specifications
GOST 5959-80	Uncollapsable wooden sheet material boxes for weights to 200 kg mass. General specifications
GOST 8984-75	Silica gel-indicator. Specifications
GOST 9438-85	Polyvinylbutyral adhesive film. Specifications
GOST 9569-2006	Paraffined paper. Specifications
GOST 10354-82	Polyethylene film. Specifications
GOST 12302-2013	Packs made of polymeric films and composite materials. General specifications
GOST 15150-69	Machines, instruments and other industrial products. Modifications for different climatic regions. Categories, operating, storage and transportation conditions as to environment climatic aspects influence
GOST 18251-87	Gummed tape on paper substrate. Specifications
GOST 23170-78	Packing for products of engineering industry. General requirements
GOST 24634-81	Wooden boxes for export products. General specifications
GOST 25336-82	Laboratory glassware and equipment. Basic parameters and dimensions
GOST 26464-85	Non-woven sheets. Method for determination of fibre migration
GOST R 53228-2008	Non-automatic weighing instruments. Part 1. Metrological and technical requirements. Tests
GOST R 55878-2013	Rectified hydrolytic technical ethyl alcohol. Specifications

Appendix B
(mandatory)

FORMS OF TWO-LAYER POLYETHYLENE PACKING SHEET



For Form 1:

H – height of TC according to overall drawings + 50 mm

S – width of TC according to overall drawings + 50 mm

L – width of polyethylene sleeve, not less than width of TC according to overall drawings + 50 mm.

For Form 2:

H – height of TC according to overall drawings + 100 mm

S – width of TC according to overall drawings + 100 mm

L – width of polyethylene sleeve, not less than width of TC according to overall drawings + 100 mm.