# METHOD FOR INCREASING THE SERVICE LIFE OF AGRICULTURAL EQUIPMENT

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## ABSTRACT

Agricultural machines used in crop production are used cyclically and for short periods from mid-spring to mid-autumn, and the rest of the time they are kept in storage areas for a long period. The article discusses issues of increasing the reliability and increasing the service life of agricultural machinery and equipment. Increasing the reliability of agricultural machinery and equipment is achieved by preventing metal corrosion during long-term storage, and increasing service life is achieved by maintaining and controlling temperature and air humidity in a sealed shelter.

**Keywords:** corrosion, cover, agricultural machinery, storage.

## INTRODUCTION

Increasing the reliability and extending the service life of agricultural machinery and equipment is the main task of the engineering and technical service of agribusiness enterprises. Most of the agricultural machines involved in crop production are used cyclically and for short periods from mid-spring to mid-autumn, and then are kept in storage sectors for a long period [1,3].

## MATERIALS AND METHODS

To solve the above problem, a method for group storage of equipment and a device for group storage of equipment can be used [2], including placing equipment objects in a sealed shelter, maintaining the required temperature and relative humidity of the air inside the shelter by blowing air with a lower relative humidity and control of air parameters. The hermetically sealed cover is common to all equipment.

## RESULTS AND DISCUSSION

A damper zone is formed around the sealed shelter, separating the shelter from the external environment, and the damper zone is formed with the possibility of entering the sealed shelter through it. In this case, the internal volumes of the equipment are first purged with air, and then the internal volume of the sealed shelter is purged. To blow through a sealed shelter, air is used that comes out as a result of blowing from the internal volumes of storage objects. At the


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same time, in a sealed shelter, air convection is provided for each equipment object and an individual blowing mode is set by changing the pressure of the air stream so that in the internal volumes of the object, relative humidity and air temperature corresponding to the climatic conditions for storing equipment objects are achieved simultaneously. Air purging of the internal volumes of equipment is carried out until the temperature and relative humidity of the air inside the sealed shelter reach the specified values [4].

The disadvantage of this method is that the process of reducing relative air humidity occurs inside a closed volume (in the internal volume of the storage object) and in a closed cycle: when the relative humidity increases, dried (heated) air is passed through the internal volume of the storage object. ) air and mix it with the air of the internal volume of the storage object until air with the required humidity is formed in its internal volume. However, when the air is heated, condensation may form on the cooled surfaces of a piece of equipment, and consequently, the storage conditions for the equipment worsen. At the same time, since temperature and relative air humidity sensors are installed inside a sealed shelter, this does not provide reliable information about the likelihood of dew point occurrence on the surface of equipment, which worsens their safety.

In order to increase the reliability of machines and equipment for agricultural purposes by preventing metal corrosion, a method is proposed for storing equipment in a hermetically sealed shelter [2], in which the required temperature and relative air humidity are maintained and air parameters are monitored. To prevent the formation of condensation on the surface of equipment and dome-shaped shelters, it is proposed to heat them with infrared emitters to a temperature above the dew point temperature [1]. Infrared emitters are installed in the air gap between the equipment and the dome-shaped shelter and are connected to a control unit that includes sensors for monitoring temperature and air humidity under the shelter. The uniform distribution of infrared radiation over the surface of the storage object is ensured by the symmetrical placement of infrared radiation sources and the use of isothermal material with high reflectivity as a covering material.

The device for storing machinery and equipment for agricultural purposes (Fig. 1) consists of a metal frame 1 made of 60/27 mm profiles and interconnected by single-level connectors (single-level connectors are not shown). An isothermal material is fixed to the metal frame 1, the outer and inner surfaces of which are made of silver, which forms a dome-shaped cover 2.


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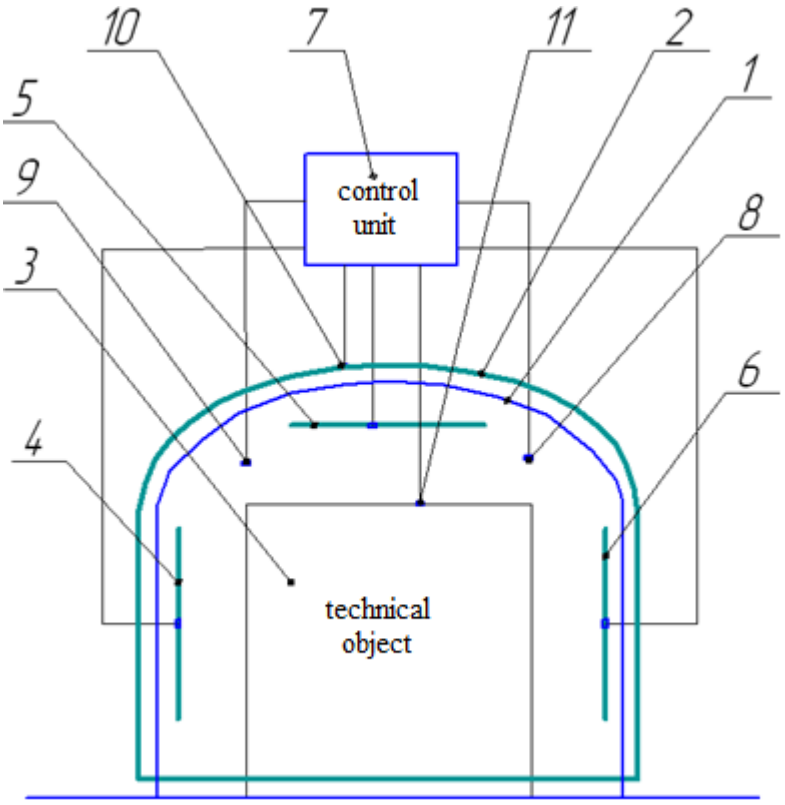


Fig.1. Device for storing machinery and equipment for agricultural purposes:

1 - metal frame; 2 – dome-shaped cover; 3 – technical object; 4,5,6 – infrared emitters; 7 – control unit; 8,9 – sensors for monitoring temperature and air humidity under the cover; 10,11 – surface temperature sensors of the equipment object and cover

The dome-shaped cover 2 on the frame 1 is fixed with an air gap between the storage object 3 and the surface of the cover 2. In the air gap between the equipment object 3 and the cover 2, infrared emitters 4,5,6 are installed, connected to the control unit 7, which has which includes temperature sensors 8 and air humidity 9 under the cover, as well as temperature sensors for the surface of the cover 10 and temperature sensors for the surface of the equipment 11.

Installation of a metal frame 1 of the required shape and size is carried out in an open area. The shape of the frame 1 corresponds to the shape of the technical object 3. The frame 1 is made of 60/27 mm profiles of various lengths.

Thus, a high probability of condensation formation occurs during sharp temperature fluctuations, as well as during depressurization of cover 2 or depreservation of equipment 3. In the air gap between equipment 3 and cover 2, infrared emitters 4,5,6 are installed, which generate infrared radiation for heating solids and preventing the formation of condensation on the surfaces of the technical object 3 and the dome-shaped cover 2. Since air is an optically transparent medium, its heating by radiation is minimal, and moisture condensation on more


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heated solid bodies - the technical object 3 and dome-shaped cover 2. The operation of the infrared emitter 4,5,6 is controlled by the control unit 7, which includes sensors 8,9 for monitoring the temperature and humidity of the air under the cover, as well as sensors 10,11 for the surface temperature of the equipment object 3 and cover 2. Analysis of sensor readings allows the control unit to determine the moment the dew point drops and ensure that the infrared emitters are turned on only at critical moments.

**CONCLUSION**

The use of this storage method will reduce the corrosion losses of agricultural machinery metal from exposure to atmospheric moisture, which will increase the reliability and service life of agricultural machinery.

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