To Question Use Caddy for Transportation Vegetables

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Keywords: Soft Containers, Transportation, Polypropylene.

Abstract: The paper discusses the use of soft containers (MC) for transportation of vegetables, especially root crops. Until recently, MK, simply put bags, used in agriculture for cargo weighing up to 100 kg. As the increase in the proportion of mechanization in the urgent becomes the use of MK larger size, because their advantage is obvious. The article discusses the pressure on the walls of production of small and large size MC and compared with the strength of polypropylene fabric. The calculation of pressure on the walls of the MC shown the possibility of using different density PP fabric.

1 INTRODUCTION

In the following years, comprehensive measures were implemented in the Republic to support international carriers, to introduce modern information technologies in the provision of logistics services and to create an effective transport infrastructure.

Despite the large-scale practical work carried out today in the field of transport and logistics, there are still systemic shortcomings in this field, requiring improvement of certain norms and harmonization based on world experience, reducing the sector's share in the hidden economy.

2 MATERIALS AND METHODS

The widespread use of soft containers in the world today makes them an advantage over other types of containers (metal, wood, plastic, small wooden crates, iron barrels vaxacoza), which are associated with a number of advantages.

- small capacity coefficient of transport comb (0.01....0,02);
- small price (5-10$ 1 T per load);
- complex mechanization in loading, laying, unloading, storage, inability when using a simple bag;
- achieve a high utilization rate when applying soft containers to the storage area, especially when laying up.

In recent years, there has been a sharp increase in the transportation of soft containers and the storage of cargo (Melikhova and Tekuteva, 2012), (Umarov and Salimov, year?).

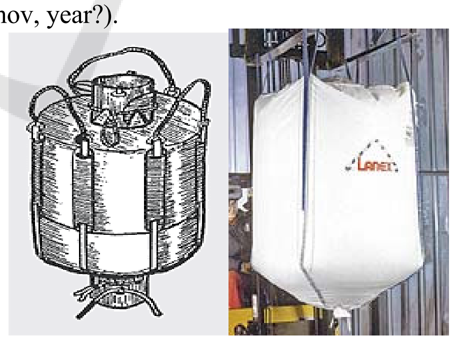

Figure 1: First made and modern soft containers. The Taykon softok container is on the left. In the middle 95x95x130 four stanzas, single layer, bottom drop knot.

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Juraeva, G., Maxmudova, N., Djabborova, M. and Abdikayimova, G.
To Question Use Caddy for Transportation Vegetables.
DOI: 10.5220/0014244000004738

In *Proceedings of the 4th International Conference on Research of Agricultural and Food Technologies (I-CRAFT 2024)*, pages 212-215
ISBN: 978-989-758-773-3; ISSN: 3051-7710

Experimental-industrial soft containers designed to transport liquid foods such as sunflower oil are being produced. Then soft containers, hermetically sewn from dense material, are provided with fasteners that are placed on the platform (1000x1200 mm) and installed at the corners (Levachev, 1984).

The filling of the soft container is carried out through a special valve using a pump. The platforms can be increased to closed railway cars, large-ton cutters. Such a wide and effective application of soft containers today is a significant competition for traditional containers.

Soft containers were first manufactured in 1919 by the Japanese firm" Taiyo Kogro Co". The farm is designed to carry a scattered load on the railway, with a small lift at the head of a soft container named "Taykon". It was then that the United States and Western European countries began to apply the cargo. For the first namanu, natural fibers were used – cotton palatnos, brizent and hakozo.

They did not have a high level of resistance , and they quickly rotted and did not have a long service life, so the external support system, on which supports were installed inside or outside, was made of standing upright angular carcass.

In the middle of the 20th century, the development of the chemical industry of the 1950s and 1970s, synthetic polyamide and paliefir fibers were applied when working the edges of the load canter. Polyamide fibers (nylon, Capron, perlon and hakazo) are very resistant to chemicals, able to withstand water and forces. Its disadvantage is wear and tear under the influence of light, and the coefficient of stretching is relatively high.

Polyfoil fabrics (teripen, tetran, diopen) are crispy, resistant to sunlight and atmospheric influences, but have the property of static electricity collection. Fabrics from artificial fiber (viscase, artificial silk) have also been used in cargo container Assembly, which are robust and transmit initial 60% resistance due to moisture exposure in their durability and subsequent hydrolysis.

The shipping container (Big-beglar)is made of quality, foliar before the shipping elements and now the hook.

In the CIS countries, cargo containers with the following description are used:

- SPK-1.5 m mainly designed for polystyrene Transportation, two-layer, 4-hook hole pogruzchik, loading and unloading;
- KS-superphosphate, designed for granular polyethylene, made of poddon, rubber-added fabric, similar in size to the current Belting material 1.3 m3, length 910 mm, width 700 mm, height 180 mm, climbing capacity 1.5 t;
- MK P, j-L. For different load, from rubber-mixed fabrics visnoxa, Capron, kouchik (brands Skms, nk, Ski and SKD), lifting holes with a tape on MKR, J-ada ironwork.

In the above types, the weight went up to 95 kg due to the addition of rubber as a fabric, and sometimes it was not planked.

Currently, patents for more than 2000 inventions have been obtained on soft containers. Despite the large number of patents, their main elements remained the same; loading and unloading nodes, load elements, hanging pendants, pocket for documents.

The soft container is processed from different fabrics according to the load mass and purpose for the upper layer material, making 1-2 layers after the load is filled some soft containers have a cylinder, sometimes a parallelepiped form. Big beglar (soft containers, Big beg–big bag) is a widely used universal.

The most commonly used sizes of soft containers:

- two stanzas, one stanza, two stanzas, two stanzas;
- 75x75x125 double stanza, single layer;
- 75x75x125 double stanza, double layer;
- 75x75x150 double stanza, single layer;
- 95x95x130 four stanzas, single layer;
- 95x95x150 four stanzas, single layer;
- 95x95x180 four stanzas, one layered.

3 RESULTS AND DISCUSSION

The issues of establishing the production of big-begs in the conditions of Uzbekistan, conducting research, calculating pressure on bags, finding fabrics that can raise this pressure and sewing soft containers should be considered.

We consider the structure of the container to determine the size of the pressure on the wall of soft containers (Figure 2).

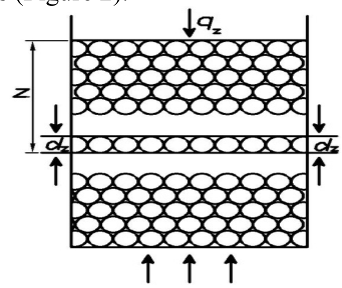

Figure 2: Drawing to calculate the magnitude of the product impact forces on the walls of soft containers in the q_x layer at a depth of Z.

From the upper surface we separate the elementary layer of d_z at the depth of Z, and if the product has γ mass, the force directed from the top in the layer is q_z and from the bottom is q_z+dq_z force, and the forces of friction by the wall are affected. The force falling from the top to the load is negative.

The equation of forces is expressed as:

$$\gamma_z Sd_z+Sq_z- Sq_z-Sd_z-fEq_zS=0$$

Thus, if we consider the horizontal layer for the product (potatoes, apples, pears, carrots, etc.) that is being put to maintain the equilibrium conditions and calculate the forces of action, it is possible to find a pressure of q_z at a depth of Z. As an example, the pressure acting on the container wall is q_z, and the pressure on the product is calculated relative to the potato and the carrot product. On an industrial scale, soft containers of 500-1000 kg are used. The density of potatoes is 650 kg/m^3, the density of carrots is 550 kg/m^3. We bring a calculation methodology for a simple bag. At a depth of container radius r = 0.25 m Z, the friction angle of the product is 25^0.

S=πR^2 counting S=0,196m^2 U=2πR U=1,57 m assuming that

The coefficient of internal friction of the product is equal to the tangent of internal friction:

$$f=tg\,\alpha = tg\,25^0=0{,}4663$$

Side pressure coefficient E=$\dfrac{1-\sin\alpha}{1+\sin\alpha}$, sin $\alpha = \sin 25^0= 0{,}4226$

While E=0,4 (2) and (3) from formulas q_z and q_x we find the q_x

Table 1: Table for calculating the pressure of potatoes on the bottom and wall of the container.

Characteristic	Z, m	$q_{z,\,Pa}$	$q_{x,\,Pa}$
Size field positioning depth, m	0,1	4600	1840
	0,2	8490	3390
	0,3	12020	4810
	0,4	15560	6220
	0,5	18740	7500
	0,6	20160	8060
	0,7	22280	8890
	0,8	24050	9620
	0,9	25460	10180
	1,0	26880	10750

We take the size of the container as 95x95x1300 CM, and in the next table we will calculate the effect of potatoes on the wall.

Table 2: Calculation of the effect of potatoes on the wall.

Characteristic	Score
Z, m depth	1,3
Container eni a, m	0,95
Container length b, m	0,95
$q_{x\ MPa}$	0,85

The result of the research and their discussion.

The following outline graph illustrates the dependence of pressure on the walls and bottom of a soft container with a small volume and a large volume and the weight of the product inside the container (Figure 3).

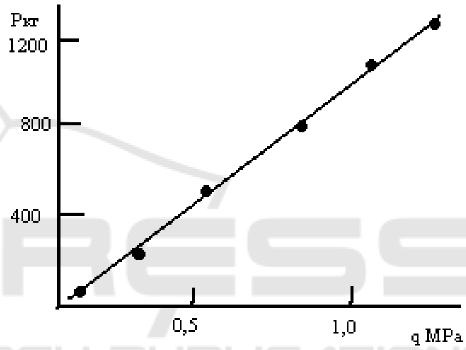

Figure 3: Pressure on the walls of the soft container and the weighted attachment of the product.

4 CONCLUSIONS

As can be seen from the graph, the Wall pressure on a large container did not exceed 1.5 MP. Soft containers have been produced from PP in recent years. Ppni has the property to withstand pressure up to 40 MPa (Proizvodstvo, 2024). Such highly resistant PP fabrics are used to produce very large containers with a load of 3-4 tons (Proizvodstvo, 2024). So, it is possible to produce small soft containers for agricultural products from thin PP fabric and thicker fabric for large bags, and fulfil orders according to the technical indicators of PP fabric.

REFERENCES

http://agrobiznes.ru/agro/agroprod_0004010

http://agrosetka.ya.ru/ - this page is not found !!!

http://www.center-pack.ru/articles/polipropilen-i-oblast-ego-primeneniq - not found !!!!
Levachev N.A., 1984. Mechanization of loading and unloading, transport and storage operations in the food industry. – M.: Light and Food Industry.
Melikhova L.V., Tekuteva L.A., 2012. Raspredelenie davleniya v myagkix container dlya xraneniya plodoovotshnoy produktsii. Khranenie I pererabotka selkhozsirya, № 10: 54-55.
Proizvodstvo P ?????????????????
Umarov V.F., Salimov G.I., 2013. TASHSTU The use of optimal containers for transportation and storage of agricultural products. St. Petersburg, International Conference. Institute of Cold, 352-353.