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Production Of Polypropylene Bags

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Annotation: In this article is given the manufacture of polypropylene bags, in particular development technology production of bags and bag fabrics, technological processes for treatment and preparation of raw materials to weaving, chosen and proved equipments and especially for making bags and bag fabrics. cost performance equipments are also given for the production of polypropylene bags in USD.

Key words: thread, polypropylene, fabric, bag, lamination, extruder, machine.

In the current economic conditions, it is expedient and necessary to develop the national industry based on the use of economical and efficient technologies for the production of high-quality products. In our case, such products are an assortment of bag fabrics, that is, the most popular, bought and in demand relative to others. Sack fabrics must meet many quality indicators, in particular, have excellent ergonomic properties, modern texture and design, and compliance with standards for physical and mechanical properties [1].

In the Republic of Uzbekistan with its own raw material base, it is relevant to develop the production of high-quality and competitive bag fabrics and, as a result, saturate the domestic market with this product (thus reducing the share of imports) and achieve good export opportunities.

Polypropylene bags are often used for storage, transportation and packaging of food and non-food products. They have a fairly low cost and wide application. Polymer packaging is practical and greatly simplifies the sale of products. Such packaging is more often used for packaging bulk food products (sugar, salt, cereals), fertilizers, building materials. The maximum weight of the contents of the bag depends on the size and density of the bag and can reach several centners. Also, polypropylene bags are packaging containers designed for storage and transportation of bulk building materials, small parts, mineral fertilizers, chemicals, animal feed, and agricultural products. The function of such bags is to protect products from damage. Therefore, the manufacture of this type of packaging requires the use of advanced technologies and high-quality raw materials in order to obtain high-quality finished products. They produce polypropylene fabric with a width of 28cm, 33cm, 38cm, 40cm, 42cm, 50cm, 55cm, 57cm, 65cm, 78cm, from which bag containers of any size can be made along the length. It is also possible to produce laminated and laminated bags with gluing a marking film.

The production process of polypropylene bags consists of several stages:

- mixing and drying of raw materials, where primary and secondary polypropylene granules are mixed with dyes and necessary additives. Calcium carbonate is often used, which gives the packaging a white color and the desired rigidity. Then the finished mixture is fed into a polypropylene extruder with a flat slotted nozzle and heated to 260 ° C.;
- manufacturing and winding of a flat thread, where the heated mixture passes through the nozzle in the form of a thin film. After cooling, it is cut into flat threads of the required thickness, hardened, drawn and wound on coils;
- fabric production, where the circular loom is adjusted to the required parameters - the density of the fabric, the weave of the threads and the width of the fabric are set. The resulting polypropylene sleeve for the manufacture of bags is wound on packages (bobbins);
- cutting, where the finished polypropylene fabric is cut into blanks by hot cutting. The cut line can be straight or wavy.

Polypropylene thread is obtained by extrusion of polypropylene granules. When fed to the extruder, the granules are heated to 260 ° C and squeezed out through the channel of the extruder head, turning into a thin film, which is fed to the cutting mechanism, which cuts it into strips - polypropylene threads. A winding machine is installed in one line with the extruder, which makes it possible to optimize the production process as much as possible [2].

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To date, the main ways of processing polypropylene are extrusion - industrial injection molding, mechanical pressing and thermoforming. Studying the characteristics of polypropylene and plastics, as well as their scope, allows you to select the necessary raw materials for the production of almost any product for technical and household purposes. Basic properties of polypropylene. It is a non-polar polymer from the class of polyolefins. Externally, polypropylene in a granule looks like a white substance. Polypropylene granules are intended for the production of technical and household products, films, as well as for laminating bags with polypropylene. A plastic crusher grinds any plastic waste into crumbs suitable for loading into an extruder.

For the production of polypropylene threads, the following equipment is used - a dispenser and an extruder. The purpose of the dispenser is to mix, prepare and dry polypropylene granules. The production of polypropylene yarn and winding it on coils is carried out on a unit for extruding polypropylene yarn (extruder) and on a unit for winding polypropylene yarn on coils.

Flat thread extruder. It produces a wide polymer film, slits the film into threads, stretches them to the required thickness and stabilizes them [3].

A four-shuttle circular loom knits a fabric in a sleeve of a given diameter and winds it into a roll. Features of a four-sided circular loom: the number of shuttles - 4; method of feeding weft and warp polypropylene threads - negatively by braking; type of weave - linen; retraction and winding of tissue - negatively by inhibition; regulation of the size of weaving along the width of the bag fabric - changing the diameter of the ring; machine drive with frequency control; use of narrow (in the form of flat ribbons) thread of different quality, including 100% plastic reproduced narrow threads; automatic stop of the machine when the warp or weft threads break.

Features of the extruder for bag fabric lamination: hanging shear extruder; machine drive with frequency control; the thickness of the polypropylene fabric is within 0.018 - 0.08 mm; water forced cooling; material release roller - automatically adjustable; performs a single one-sided or two-sided application of components on bag fabric; materials - polypropylene fabrics, polyethylene film, paints, plastic papers, or films of chromophototype when resinifying materials in case of their fusion.

Features of the color bag printer: maximum 4 colors; winding type tension tightening; automatic correction of deformation; two workplaces for the collection and release of materials; opening and closing of the roller air-hydraulic; separate drying with warm air; can set the number of printing from 1 to 4, auto-close after printing; release of a watchful signal by footage; manual and automatic control of the print roller; single-sided or double-sided printing can be done.

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Features of automatic bag cutting machines: cuts the bag and sews the bottom; automatically performs hot cutting and sewing of the bottom of chromophototype or clean fabric; touch screen setting control of servomotor drive and bag length; lack of accretion on bag seams after hot cutting; automatic reading of the number of bags and their folding; pneumatic stacking of a given number of bags.

The hydraulic bag baler presses the finished bags into tight bales for easy transportation and space-saving storage.

Polypropylene bag, laminated, with a blue stripe on the end, the neck is melted. Other indicators according to GOST 30090-93, TU 2297-001-71222098-04.

The size of the workshop for placing equipment is 5000-7000 m2, the ceiling height is more than 4.5 m, with a flat field. Electricity requirement 380v 50hz 800 kW ± 10% three phases, five lines, water consumption 30 m3/hour. The number of employees on the project is 45 people, with three shifts, including two specialists in the field of electricity.

Thus, we have developed a technology for the production of sacks and sack fabrics, a technological process for processing and preparing raw materials for weaving, selected and justified equipment and their features for the manufacture of sacks and sack fabrics. The table also shows the cost characteristics of equipment for the production of polypropylene x bags in c.u.

Table

Cost characteristics of equipment.

№	Designation	Type (brand)	Quantity	Units (c.u.)	General (c.u.)
1	Dry Mixer	GY-YFJ-50	5	1760	8800
2	Machine for the production of polypropylene threads, winding on spools	GY-LS-160/3200B	2	193600	387200
3	Steel spools for winding polypropylene threads		200000	0.5	100000
4	Four Sided Circular Loom	GY-YZJ-4-750BH	80	7200	576000
5	Bag Making Machine	GY-FM-1000	1	47960	47960
6	Color Printer For Drawing A Picture (Trademark) On Bags	GY-RY-4800	2	37200	74400
7	Automatic Slitting Machine	GY-DNQFJ-800	3	39600	118800
8	Hydraulic Press Packs (Compresses Manufactured Bags For Packaging)	GY-DBJ	2	7200	14400
Total : 1.327.560 c.u.					

Literature

1. Rakhimkhodzhaev S.S., Kadyrova D.N. Theoretical foundations of the process of tissue formation. Textbook. Tashkent. TITLP. 2018.
2. Weaving II. Shuttleless Looms. Coordinators: Prof. P.A. Khatwani, Prof.A.K.Gupta. INDIA, 1999.
3. HTTP://VW/W. PYSJZC.COM..