ATLANTIS-PAK

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Packaging Solutions

AMISMOK KS CASING

Process Operating Manual

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1. APPLICATION

The **AMISMOK KS** casing is designed for production of processed sausage cheeses made by technological processes that involve the stage of smoking.
The **AMISMOK KS** casing is made from blends of high-quality synthetic and natural materials.
Processed cheeses must be stored at a temperature of 2±2 ºC and air relative humidity not higher than 85%. The shelf life of processed cheeses shall be fixed by the manufacturer and approved in the prescribed manner.

2. ADVANTAGES

2.1. Smoke permeability makes it possible to impart to the products a smoked taste and flavor, and contributes to formation of the smoked crust and glossy surface.

2.2. Caliber consistency makes it possible to produce chubs of standard sizes, including preset-weight chubs, when automatic equipment is used**.**

2.3. High mechanical strength of the casing makes it possible to mold the chubs not only by manual tying, but also with the use of high-capacity clipping equipment of various types.

2.4. High elasticity of the casing makes it possible to overstuff the **AMISMOK KS** casing relative to the nominal caliber, thus reducing the specific consumption of the casing per unit of the product .

2.5. Low permeability to oxygen and water vapor compared with cellulose films and protein casings makes it possible to extend the shelf life of the finished products

2.6. High heat resistance makes it possible to carry out smoking at higher temperatures in comparison with the cellulose films and protein casings

2.7. No microbiological degradation, because the polymers used for production of the casing are inert to the effect of microorganisms.

3. ASSORTMENT OF PRODUCTS

The usable calibers for the **AMISMOK KS** casing are 29 to 90mm.
The casing colors are selected in accordance with the catalogue: brown, salmon, claret, light smoke, smoke, light brown, light brown 1, dark brown, orange, cream, clear.

Single- or double-sided printing is possible on the casing. The number of print colors varies from 1 to 6; the options include CMYK printing with permeable inks or self-adhesive labels.
The **AMISMOK KS** casing is supplied in 1000m rolls or in 38m or 50m strands packed into shirred sticks.
The optional services include:
- printing: edge-to-edge printing;
- shirring: shirred sticks with a loop under the rear clip;
- optional length of the shirred sticks or strands.

4. UTILIZATION TECHNOLOGY

4.1. Storage and transportation of the casing

4.1.1. The casing must be stored in its original packing in dry and clean rooms complying with the sanitary and hygienic standards applicable to the relevant sectors of the food industry, at a distance not less than 1 m from any heating appliances, in the absence of strong-smelling or corrosive substances, at a temperature not exceeding 25º C, and air relative humidity of 50-60%.

4.1.2. During storage and transportation, do not expose the cases containing the casing to direct sunlight or high temperatures.

4.1.3. Open the manufacturer's packing immediately before processing of the casing. If the integrity of the manufacturer's packing is compromised during storage, exclude any possibility of premature humidification (wetting) of the casing during the subsequent storage, since it may cause adhesion of the casing in the process of drying and rupture during the processing.

4.1.4. If the casing was transported or stored at a temperature below 0 °C, then prior to use keep it at room temperature during at least 24 hours in the manufacturer's packing.

4.1.5. Never drop the boxes with casings or subject them to impacts.

4.1.6. Never stack casing rolls without cardboard spacers between the roll ends.

4.2. Preparation of the casing for use

Preparation of the **AMISMOK® KS** casing for use consists in the following.
Bring the casing to the shop from the store room, put it on a dry surface (floor, table), then open the manufacturer's packing immediately before processing of the casing.
The casing is supplied ready for use, i.e. it does not require additional wetting before molding.

4.3. Preparation of the cheese mass

The composition of the cheese mass and the sequence of operations for the production of smoked processed sausage cheeses shall be in accordance with the applicable regulatory documents.

4.4. Molding of sausage cheeses

Start molding of the **AMISMOK KS** casing with inspection the equipment and the work table.
Make sure that there are no burrs on the equipment parts, or sharp objects, indentations, or rough areas on the working surface of the table, in order to avoid damage to the casing.
The **AMISMOK KS** casing is suitable both for manual tying of chubs, and for the automatic and semi-automatic filling and clipping equipment.
Never puncture the chubs. The casing will burst, if punctured.
To obtain smooth-surface chubs of processed sausage cheese without wrinkles or folds, it is recommended to overfill the casing with the cheese mass by 10-12% relative to the nominal caliber of the casing. Thus, when the 45mm nominal caliber casing is used, the recommended stuffed caliber should be 50.0 - 52.0 mm. This provides for the desired appearance of the finished product and reduction of the specific consumption of the casing per unit of the product.
If the ends of the chub are clipped, follow the recommendations on the use of the clipping equipment for secure fastening of the clips (see Table).

Recommended clip types

Table 1

Caliber	POLY-CLIP		TECHNOPACK		COMPO	ALPINA
	Clip interval 15 Interval 18	Clip series S	Clip series E	Clip series G	Clip series B	Clip interval 15 Interval 18
29-65	15-07/4*1.25 15-07/5*1.5 15-	524 528 625 628	210 410	175 370	B1 BP1	15-07/5*1.5 15-07/5*1.75 18-07/5*1.5 18-07/5*1.75

	07/5*1.75 18- 07/5*1.5 18- 07/5*1.75					
70-90	15- 08/5*1.5 15- 07/5*1.75 18- 07/5*1.5 18- 07/5*1.75	628 632	212 220 410	175 200 370	BP2 B2	15-08/5*1.5 15-07/5*1.75 18-07/5*1.5 18-07/5*1.75

In case of manual tying of sausage chubs, pay special attention to the quality of the tying material, and soak the string, whenever necessary, to soften the hard inclusions and prevent damage of the casing.

4.5. Thermal processing

Choose the smoking conditions based on the following.

Never smoke wet chubs. Smoking of wet chubs makes the products matte, dull, sometimes spotty. After molding it is recommended to cool the products down to the temperature of 30°C on the surface of the chub (approximately 4-5 hours from filling of the casing with the cheese mass). This will ensure the best way to prepare the chub surface for further smoking.

The stage of drying precedes smoking. The drying temperature may vary from 50 to 55°C during 15 - 20 minutes at air relative humidity less than 50%. As the drying cycle progresses, the temperature is gradually raised to 65 - 75 °C.

This stage is followed by smoking. To achieve the best quality of the product and the stronger smell, smoking should be carried out in a heat chamber at a temperature above 70 °C.

To obtain the characteristic crust on the finished product, smoking should be combined with air circulation for uniform distribution of moisture in the heat chamber and the most effective evaporation of moisture off the surface of the cheese chub.

For the selection of the mode (program) of smoking, consider not only the sensory characteristics, but also the adhesion of the casing with the cheese mass, and peelability. The combination of excessive temperatures (80 - 90 °C) and very low humidity (20%) may lead to poor peelability of the finished product.

The duration of smoking and the optimum humidity will depend on the type of the smoking unit. The higher is the smoke density in the unit, the shorter is the smoking time (from one to several hours).
Adjustment of the temperature, humidity, and duration of the smoking process makes it possible to vary the thermal processing losses, the color, and the taste of the product.

Thermal processing in stationary shaft-type smoking chambers

The conventional hot-smoking chambers have no control systems. The smoke mixture rises in parallel to the product surfaces, i.e. in the most unfavorable direction. Therefore, the velocity of the mixture must be rather high to form turbulent flows. But as the smoke flow velocity increases, more smoke will escape from the chamber and the smoke density will be insufficient to for the smoke crust, flavor and taste. The optimal smoking velocity is 0.12 – 0.25 m/s.
We recommend the following smoking mode for caliber 50mm smoked sausage cheeses:

Process stage	Temperature, ºC	Stage duration, minutes
Drying	50-55	20-40
Smoking	65	30
Smoking	70	30
Smoking	75	40

Smoking in universal heat chambers

The optimal heat treatment conditions are achieved in programmable hot smoking units.
The universal heat chambers provide for easy control of all process parameters: humidity, smoke intensity, and temperature.
Smoking in the universal heat chambers can be achieved by means of:
- smoke and air mixture (convection smoking);
- steam and smoke mixture, when the steam is heated to the desired temperature and passed through wet sawdust;
- spraying of liquid smoke.

All these methods can yield good results. However, the latest studies have shown that the smoke produced by smoldering sawdust greatly varies in its qualitative composition, depending on the smoke generation temperature, the stack draft,

which in its turn depends on the atmospheric conditions, and on the temperature and humidity of the inlet air. The amount of moisture contained in the smoke is critically important.

At present the experts think that steam smoking or spraying of liquid smoke is better than convection smoking, for a number of reasons:

- first, such smoking ensures a stable composition of the smoke, and reduced content of harmful substances, such as benzpyrenes;
- second, the way that the smoking substances penetrate the surface of the casing (dissolved) is more effective than during convection smoking;
- third, lower temperatures can be used, and the thermal processing time can be reduced, since steam transfers heat several times faster than air. The result is reduced losses due to evaporation of moisture off the surface of the product;
- fourth, weight losses become lower, because the atmosphere is saturated with steam.

However, steam smoking requires a longer drying stage to give the time for the formation of the characteristic crust on the surface of the product.

Convection smoking

Convection smoking is the most common method of sausage cheese smoking. The first stage, which is drying, can be divided into two sub-stages - preheating, and drying proper with the temperature being gradually raised from 55 to 65 °C, at the relative air humidity less than 50%. The drying lasts 30 - 40 minutes (another option is preheating during 15 - 20 minutes followed by 15 - 20 minutes of drying). At this stage coagulation of the surface proteins occurs with release of moisture, therefore it is desirable to use exhaust ventilation to maintain the humidity gradient between the product and its environment.

The next stage is smoking at a temperature of about 65 - 70 °C and the relative air humidity of 40 - 60% with the exhaust ventilation running, because the product still releases moisture. The duration of smoking should be at least 40 - 60 minutes at the maximum smoke intensity.

Any parameter of this process can be varied, depending on which is the more preferable - formation of the characteristic colored crust, or reduction of losses during the thermal processing.

4.6 Transportation and storage of sausage products

Transportation and storage of cheese products manufactured with the use of the **AMISMOK KS** casing shall be in accordance with the relevant regulatory documents.

To prevent moisture losses during storage, it is recommended to use secondary packaging in the form of a polyethylene insert bag inside the corrugated box (a suitable insert is the bag for butter pieces). This will significantly reduce the cheese dry-up losses during the standard shelf life for the finished product, and keep the secondary packaging costs to the minimum.

5. MANUFACTURER'S GUARANTEES

The Manufacturer guarantees conformity of the casing with the Specifications, subject to compliance with the terms of transportation and storage the user's warehouses.

The guarantee term of storage of the casing is 3 years from manufacture, subject to integrity of the manufacturer's packing.

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