



**ATLANTIS-PAK**

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Packaging Solutions



## AMISMOK CASING

Process Operating Manual



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## 1. APPLICATION

The **AMISMOK** casing is designed for production of all kinds of semidry sausages, wieners and hot dogs, and processed cheeses made by technological process that involve smoking (smoke roasting).

The **AMISMOK** casing is made from blends of high-quality synthetic and natural materials.

The **AMISMOK** casing is supplied straight or ring-shaped, which makes it possible to expand the assortment of the products by diversification of the appearance of the sausages: rings, half-rings, festoons.

## 2. ADVANTAGES

**2.1.** The **smoke-permeable AMISMOK** casing makes it possible to roast and smoke products to impart to them the characteristic pleasant taste and flavor, and to create the coagulated protein crust and glossy surface of the products under the casing.

The **high mechanical strength** of the **AMISMOK** casing makes it possible to use high-capacity automatic and semi-automatic clippers, which provides for a high rate of production, and stability of the shape.

**2.2.** The **high elasticity** of the casing makes it possible to overstuff the **AMISMOK** casing by 10-12%.

**2.3.** The **high oxygen barrier capacity** compared to collagen and viscose-reinforced casings ensures the following advantageous properties:

- reduction of the oxidation processes, in particular, rancidification of speck;
- preservation of the individual flavor of spices in the finished products throughout the shelf life.

**2.4.** With its **low permeability to water vapor** the **AMISMOK** casing is an economic alternative to collagen and viscose-reinforced casings, because moisture losses are reduced during thermal processing and storage (it has been proved in practice that the thermal processing losses for products in the **AMISMOK** casing are 1.5 times lower). The water vapor transmission rate of the **AMISMOK** casing is 1.5 times less than that of collagen and viscose-reinforced casings, which makes it possible to

- achieve the required degree of smoking of sausage products with characteristic taste and flavor, and the coagulated protein crust on the surface;
- reduce the moisture losses during thermal processing and storage of sausage products in the **AMISMOK** casing.

**2.5.** **High heat resistance** of the polymers used for production of the **AMISMOK** casing significantly extends the temperature range of use of this casing in comparison

with collagen and viscose-reinforced casings. The casing is resistant not only to high temperatures of smoking (up to 75-80°C), but also to their prolonged effect.

**2.6. Microbiological resistance.** The polymers used for production of the **AMISMOK** casing are inert to the action of bacteria and mold fungi. This improves the hygienic characteristics of both the casing itself, and the finished sausages.

### 3. ASSORTMENT OF PRODUCTS

Table 1

Name and type of casing	Length in roll, lm	Caliber of casing, mm	Description
AMISMOK A	1000	29-90	Casing with good permeability, intended for molding of sausage products
AMISMOK Ako	300- 1500	29-51	Intended for production of ring-shaped sausage chubs; in other respects similar to Amismok A
AMISMOK S	1,000	29-90	Minimum adhesion to emulsion, improved permeability
AMISMOK Sko	300-1500	29-51	For production of ring-shaped sausage chubs; in other respects similar to Amismok S
AMISMOK Sm	1000	29-90	Matte casing with improved permeability
AMISMOK Smko	300-1500	29-51	For production of ring-shaped sausage chubs; in other respects similar to Amismok Sm
AMISMOK KS*	1000	29-90	Intended for smoked processed cheeses

\* Recommendations on the use of the Amismok type KS permeable casing for cheese-making are presented separately.

Colors of the **AMISMOK** casings:

Table 2

Amismok A, Ako	Amismok S, Sko	Amismok Sm, Smko	Amismok KS
White	Clear	Clear	Clear

Clear	Claret	Claret	Claret
Claret	Cherry	Cherry	Smoke
Cherry	Smoke	Smoke	Brown
Smoke	Brown	Brown	Cream
Brown	Red	Red orange	Salmon
Red orange	Red orange	Salmon	Orange
Red	Salmon	Mahogany	Light smoke
Salmon	Mahogany	Orange	Light brown
Mahogany	Orange	Light smoke	Light brown 1
Orange	Light smoke	Light brown	Dark brown
Light brown 1	Light brown	Dark brown	
Light smoke	Light brown 1		
Dark brown	Dark brown		

The color range is subject to change.

Single- or double-sided printing is possible on the **AMISMOK** casing. The number of print colors varies from 1 to 6. CMYK printing is optional.

On the ring-shaped casings, printing can be applied on the outer surface of the ring. Bespoke markings, such as printing on the lateral or the inner surface of the ring, and the exact location must be specified in the purchase order.

The inner ring diameter  $d$  of sausage chubs may be as shown below, depending on the degree of overstuffing of the casing relative to the nominal caliber (Table 4):



Table 3

Casing type	Caliber of casing, mm	Sausage chub ring diameter, mm
Ako, Smko	29-40	75-95 (90-120)
	41-51	90-120
Sko	29-51	90-120

The **AMISMOK** casing is supplied in rolls, or in shirred sticks, each containing 38m or 50m of shirred strand.



The optional services include:

- printing: edge-to-edge printing;
- shirring: manufacture of shirred sticks with a loop under the rear clip; optional length of the shirred sticks and strands.

## 4. UTILIZATION TECHNOLOGY

### 4.1. Storage and transportation of the casing

**3.1.1.** The casing must be stored in the original packing in dry and clean rooms conforming to the sanitary-hygienic standards for the relevant sector of the food industry, at a distance of not less than 1m from heating devices, and in the absence of any strong-smelling or corrosive substances, at a temperature not exceeding 25°C.

**3.1.2.** During storage and transportation, the casing should not be exposed to direct sunlight or high temperature.

**3.1.3.** Open the manufacturer's packing immediately before processing of the casing.

**3.1.4.** Open only those packages, which will be fully consumed during the technological cycle. 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.

**3.1.5.** If the casing was transported or stored at a temperature below 0°C, then prior to use hold it at room temperature for not less than 24 hours.

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

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

### 4.2. Preparation of the casing for use

The procedure for preparation of the **AMISMOK** casing for processing consists in the following:

Bring the casing to the production shop from the store room, put it on a dry surface (floor, table), then open the manufacturer's packing immediately before use of the casing.

Soak in potable water with a temperature of 20-25°C. Do not soak the casing in hot water, otherwise the casing will shrink during the soaking process.

The casing in rolls must be first cut into lengths, then soaked. When shirred sticks of the **AMISMOK** casing are used, keep the shirred stick fully submerged in water. Water must freely penetrate inside the shirred stick, driving out the air.

Requirement for pre-soaking depends on the casing type:

- matte casing (**AMISMOK** type **Sm**, **AMISMOK** type **Smko**) – used without pre-soaking;
- non-matte casing (**AMISMOK** type **A**, **AMISMOK** type **Ako**, **AMISMOK** type **S**, **AMISMOK** type **Sko**) – used with pre-soaking.

Soak during not more than 1-2 minutes *immediately before stuffing and molding*.

After the soaking, remove the residual water from the tube, and put the casing over the stuffer horn.

Do not soak more casing than is required. If too much casing was soaked, take the excess casing out of the water, squeeze to remove water, and leave until the eventual processing in a cold room (shop) away from any sources of heat and air drafts.

Prior to reuse of the casing, wet it before stuffing.

If these requirements are observed, the casing will acquire a high elasticity, which significantly facilitates the stuffing process, and provides for uniform filling through the entire length of the chub.

#### 4.3. Preparation of the emulsion

In the production of wieners and hot dogs or semidry sausages in the **AMISMOK** casing, the quantity of water added to the emulsion remains the same as when cellulose, collagen, or viscose-reinforced casings are used.

In the development of new recipes according to the regulatory documentation (specifications), the amount of the added water should be determined with regard to the moisture-retaining properties of the gelling agents used, such as carrageenans, plant proteins, animal proteins, etc., and comply with the instructions on use, to avoid any water pockets.

#### 4.4. Molding of sausage products

Start molding of the **AMISMOK** casing with inspection of the equipment and the work table.

Make sure that there are no burrs on the equipment parts, or sharp objects, dents, or rough areas on the working surface of the table, in order to avoid damage to the casing.

Do not allow any rubbing of the casing roll end against rough surfaces during the processing.

Never puncture the casing of the chubs. The casing will burst, if punctured.

The ratio between the stuffed caliber and the nominal caliber of the casing is an important factor. In the process of molding of the sausage products, take care to fill the casing as tight as possible, without air trapped inside. It is recommended to fill



the **AMISMOK** casing with 10 – 12 % overstuffing (when the 45mm nominal caliber casing is used, the recommended stuffed caliber should be 49.5 – 50.5mm, depending on the emulsion consistence and temperature, and the filling pressure). The lower the emulsion temperature and the denser the consistence, the less is the stuffed caliber.

Selection of the recommended stuffed caliber provides for a good appearance of the finished product, increases the stuffing capacity, and reduces the risk of water or fat pockets.

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

Automatic or semiautomatic clippers can be used for processing of the ring-shaped casing (**AMISMOK** type **Ako**, **AMISMOK** type **Sko** and **AMISMOK** type **Smko**). These must be fitted with string feeders and special receiver trays for the sausage rings. The string length between the ends of the sausages is adjusted by means of the string feeder.

However, if no string feeder is supplied with the equipment, this should not be an obstacle to the use of the ring-shaped casings. The string can be fed manually. When manual clippers are used, the string is fed into the clipper working zone from the side of the shirred stick and clipped together with the casing. When the casing is put over the horn, it must be positioned in such a way as to prevent the resulting rings twisting into the working parts of the clipper, and to guide them into the receiver tray.

The clip must securely hold the ends of the chub, without damaging the casing. (see Table 4).

Recommended clip types

Table 4

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
290-65	15-7- 4×1.25	524 528	210 410	175 370	B1 BP1	15-7-5×1.5 15-7-5×1.75
	15-7-5×1.5	625				18-7-5×1.5
	15-7- 5×1.75	628				18-7-5×1.75
	18-7-5×1.5					
	18-7- 5×1.75					



66-90	15-8-5×1.5	632	212	175	B2	15-8-5×1.5
	15-7-5×1.5		220	200	BP2	15-7-5×1.75
	18-7-5×1.5		222	370		18-7-5×1.5
	18-7-5×1.75		410			18-7-5×1.75

#### 4.5. Thermal processing

Thermal processing of all types of semidry sausages in the **AMISMOK** casing made by technological processes that involve smoking (smoke roasting) is performed in shaft-type and universal heat chambers.

Manufacturers should choose their own individual thermal processing modes, because the capacity of the equipment (shaft-type fixed chambers or universal heat chambers) is all-important in this process.

We recommend the classical thermal processing, which includes the stages of curing (4-12 hrs), heating of the product, drying, smoking, and cooking.

Drying should start at a temperature of 55 - 60°C. As the drying cycle progresses, the temperature is gradually raised to 60 - 65°C. At this stage coagulation of the emulsion proteins is achieved, and the 'protein crust' is formed.

The next stage is smoking at a temperature of about 70 - 75°C. At this stage further consolidation of the crust occurs and the crust becomes colored under the effect of the smoke components.

Then the product is cooked at the air humidity of 100% and a temperature of 75 - 80°C until ready for consumption.

After completion of the cooking process, it is also recommended to carry out a short drying during 5-10 minutes at the temperature of 65°C.

The processes of drying and smoking have a significant impact on the quality of the finished product. By adjusting the temperature and duration of these stages, the thermal processing losses, the crust thickness, the color and the taste of the product can be varied.

The best thermal processing conditions are achieved when the drying, smoking, cooking, and cooling are carried out in programmable units.

The universal heat chambers provide for easy control of all process parameters: humidity, smoke intensity, and temperature, with standard-quality smoke.

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 with 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 and the stack draft, which in its turn depends on the atmospheric conditions, and on the temperature and humidity of the inlet air.

At present it is believed that steam smoking or spraying with 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 benzopyrenes;
- second, the way that the smoking substances penetrate the surface of the casing (dissolved) is more effective than during convection smoking. Meat products have a lower temperature than the mixture of steam and smoke, which rapidly condensates on the product surface. The speed of smoking is higher than in the case of convection smoking. The required flavor and surface color can be achieved faster.

The following examples describe the thermal processing conditions for the **AMISMOK** casing:

Example 1 (see Table 5). Two-frame Vemag chamber (combined convection and steam smoking), beech chips.

Table 5

Process stage	Thermal processing mode	
Heating	50°C – 20 min.	Fresh air supply damper and exhaust damper are open, ventilation exhaust is on, fan speed is low
Drying	60°C – 30 min.	Fresh air supply damper and exhaust damper are open, ventilation exhaust is on, fan speed is low, smoke generator is glowing
Smoking	70°C – 30 min.	Exhaust damper is open, fan speed is low, smoke intensity is maximal
Cooking	80°C to 72°C in the chub core	Smoke supply continues, fan speed is low, smoke intensity is maximal
Drying	75°C – 10 min.	Fresh air supply damper and exhaust damper are open, fan

		speed is high
<b>Thermal processing losses</b>	<b>5 – 8%</b>	
<b>Total time</b>	<b>1 hr 55 min.</b>	

Example 2 (see Table 6). Four-frame Kerres chamber. Red Arrow atomizer.

Table 6

Process stage	Thermal processing conditions	
	Temperature, °C	Time, min.
<b>Heating</b>	<b>55</b>	<b>15</b>
<b>Drying</b>	<b>65</b>	<b>20</b>
<b>Smoking</b>	<b>65</b>	<b>Smoke supply 13 Mixing 2</b>
<b>Drying</b>	<b>65</b>	<b>10</b>
<b>Smoking</b>	<b>70</b>	<b>Smoke supply 13 Mixing 2</b>
<b>Drying</b>	<b>70</b>	<b>10</b>
<b>Cooking</b>	<b>78</b>	<b>to 72 °C in the chub core</b>
<b>Drying</b>	<b>70</b>	<b>10</b>
<b>Smoking</b>	<b>70</b>	<b>Smoke supply 13 Mixing 2</b>
<b>Drying</b>	<b>50</b>	<b>5</b>
<b>Thermal processing losses</b>	<b>6-7%</b>	
<b>Total time</b>	<b>2 hrs 05 min.</b>	

#### 4.6. Cooling

Upon completion of the thermal processing, the sausages in the **AMISMOK** casing must be immediately cooled. Cooling can be carried out under running water or shower, or by means of spraying with time-delayed equipment, until the chub core temperature is down to 25 - 35 °C .

Cold air cooling is not allowed. Exclude any exposure of the finished products to air drafts until complete cooling of sausages, because this may cause wrinkles on the surface of the product.

#### 4.7. Transportation and storage of sausage products

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



## 5. MANUFACTURER'S GUARANTEES

The Manufacturer guarantees conformity of the casing with the Specification requirements subject to compliance with the required conditions of transportation and storage at the user's warehouse.

The guarantee term of storage of the casing is 2 years from manufacture, subject to integrity of the manufacturer's packing.

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