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FIBROSMOK CASING

Process Operating Manual

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1. APPLICATION

FIBROSMOK is a new-generation casing.
The **FIBROSMOK** casing is designed for production of all types of semidry and cooked sausages made by technological processes that involve smoking (smoke roasting).
The products made in the **FIBROSMOK** casing have an elevated residual moisture content, which can be corrected by additional drying, or avoided by manufacture of the products in accordance with other regulatory standards (specifications).
The **FIBROSMOK** casing is made by an original technology from blends of high-quality synthetic and natural materials. The matte and rough texture of the **FIBROSMOK** casing surface makes it similar to viscose-reinforced casings, while the remarkable appearance of the sausage products is preserved for a long time and allows the product to stand out in the shop windows.
The **FIBROSMOK** casing is supplied straight or ring-shaped (**FIBROSMOK Ko),** which makes it possible to expand the assortment of the products by diversification of the appearance of the sausages: rings, half-rings, festoons.
The recommended shelf life is:
-30 days for cooked sausages packaged into the **FIBROSMOK** casing;
-60 days for semidry sausages packaged into the **FIBROSMOK** casing.

2. ADVANTAGES

2.1. Smoke permeability.

The **FIBROSMOK** casing is permeable to smoke, which makes it possible to roast and smoke the 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.

2.2. High mechanical strength.

The high mechanical strength of the **FIBROSMOK** casing makes it possible to mold chubs not only by manual tying, but also using various clippers to achieve a high rate of production. In contrast to collagen casings, the risk of damaging the casing with a clip is substantially lower. The rate of filling of the **FIBROSMOK** casings with emulsion is the same or higher than that for collagen and viscose-reinforced casings.

2.3. High elasticity.

The high elasticity of the **FIBROSMOK** casing makes it possible to overstuff it by 12-14%.

2.4. High oxygen barrier.

The high oxygen barrier capacity, compared to natural, collagen and viscose-reinforced casings, predetermines 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.

2.5. Low permeability to water vapor.

- the **FIBROSMOK** casing is an economic alternative to natural, collagen and viscose-reinforced casings, because moisture losses are reduced during the thermal processing and storage (it has been determined by practice, that the thermal processing losses of products in the **FIBROSMOK** casing are 2- 2.5 times less in comparison with collagen and viscose-reinforced casings).

The water vapor transmission rate of the **FIBROSMOK** casing is 1.5 - 2.0 times lower than that of viscose-reinforced and collagen casings, which makes it possible to

- achieve the required degree of smoking of sausage products with the characteristic taste and flavor, and the coagulated protein crust on the sausage surface;
- reduce the moisture losses during the thermal processing and storage of sausage products in the **FIBROSMOK** casing. By the end of the shelf life the chubs may lose some weight and minor wrinkles may appear, which make the product similar to sausages in collagen and viscose-reinforced casings.

2.6. High heat resistance.

The utilization temperature range of the **FIBROSMOK** casing is significantly wider in comparison with natural and collagen casings. The casing is resistant to high temperatures of smoking (up to 80-85 ˚C), even during a prolonged exposure.

2.7. Microbiological resistance.

The materials used for production of the **FIBROSMOK** casing are inert to the action of bacteria and mold fungi. This improves the hygienic characteristics of both the casing itself, and of the finished sausages.

3. ASSORTMENT

Straight casing calibers: 29 - 80 mm.

Ring-shaped casing calibers: 29-51 mm.

Colors of the **FIBROSMOK** casing: clear, smoke, cream, red, light brown, light brown 1, brown, dark brown, orange, red orange, claret, white, light smoke, pink, salmon, mahogany, cherry.

The color range is subject to change.

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

On the ring-shaped casings, the printing can be applied on the inner, the outer or the lateral surface of the ring. The exact location of the marking must be indicated in the purchase order.

The casing is supplied in 500m rolls, or in 31m or 38m strands shirred into sticks.

The optional services include:
- printing: edge-to-edge printing;
- shirring: shirred sticks with a loop under the rear clip;
optional length of shirred sticks;
R2U (ready to use) casing.

4. UTILIZATION TECHNOLOGY

4.1. Storage and transportation of the casing

4.1.1. 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 no less than 1m from heating devices, in the absence of any strong-smelling or corrosive substances, at a temperature not exceeding 25ºC.
4.1.2. During the storage and transportation protect the casing against exposure to high temperatures and direct sunlight.
4.1.3. Open the manufacturer's packing immediately before processing of the casing. If the integrity of the manufacturer's packing is compromised, exclude any possibility of premature wetting (humidification) of the casing during storage, because this may cause uneven humidification during the drying, and rupture of the casing in the course of stuffing.
4.1.4. Never stack casing rolls without cardboard spacers between the roll ends.
4.1.5. If the casing was transported or stored at a temperature below 0°C, then prior to use hold it at room temperature for at least 24 hours.
4.1.6. Never drop the boxes with casings or subject them to impacts.

4.2. Preparation of the casing for use

The procedure for preparation of the **FIBROSMOK** casing for stuffing 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.
Cut the roll casing first into sections, then soak. When soaking the shirred sticks containing the **FIBROSMOK** casing take care to keep the shirred sticks completely submerged in water. Water must freely penetrate inside the shirred stick, driving out the air.
Soak in potable water at a temperature of 20 - 25 °C.
After soaking, squeeze the casing to remove the residual water from the tube, and put it over the filler horn.
Soak during 5-10 minutes ***immediately before stuffing and molding***.

The R2U (ready to use) shirred casing needs no pre-soaking and can be processed immediately.
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 or air drafts. Prior to reuse of the casing, repeat soaking, this time for 2-3 minutes only.
If these requirements are observed, the casing acquires 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

For the production of cooked sausages and production of cooked and semidry sausages in the **FIBROSMOK** casing, the quantity of water added to the emulsion remains the same as when natural, collagen or viscose-reinforced casings are used.
In the development if new recipes for coked or semi-dry sausages 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., to avoid a loose structure or soft consistence of the products.

4.4. Molding

Start molding of the **FIBROSMOK** casing with inspection of 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.
Do not allow any rubbing of the casing roll end against rough surfaces during the processing.
In contrast to natural or collagen casings, never puncture the chubs in the **FIBROSMOK** casing. 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 **FIBROSMOK** casing with 12 – 14% overstuffing (e.g., when the 45mm nominal caliber casing is used, the recommended stuffed caliber should be 50.5 – 51.5mm) 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 filling 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 attention to the quality of the tying material, and 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 **FIBROSMOK Ko** casing. 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.

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 1).

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
29-55	15-7-4×1.25 15-7-5×1.5 18-7-5×1.5 18-7-5×1.75	524 528 625 628 632 735	210 410	175 200	B1 BP1	15-06-4×1.25 15-07-5×1.5 15-06-4×1.5 15-07-5×1.75 15-06-5×1.5 18-07-5×1.5 18-07-5×1.75
60-80	15-8-5×1.5 18-7-5×1.5 18-7-5×1.75	628 632 638 735 740	210 212 220 410	175 200 370	B2 BP2	15-8-5×1.5 18-7-5×1.5 18-7-5×1.75

4.5. Thermal processing

Thermal processing of all types of semidry and cooked sausages made to technologies involving smoking (smoke roasting) is performed in universal heat chambers.

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

We recommend the classical thermal processing, which includes the stages of curing (6-12 hrs), reddening (heating of the product), drying (color formation), smoke roasting, and cooking.

The stages of reddening (heating of products) and drying should start at a temperature of 45°C- 50°C and at the minimum air humidity. At this stage coagulation of the stuffing proteins is achieved, and the 'protein crust' is formed.

As the drying cycle progresses, the temperature is gradually raised to 65°C. Then, starting from 65°C and to 75°C at the air humidity of 50 – 60%, step-by-step smoking is performed to procure for uniform smoking of the product surface.

At a temperature of more than 60°C, smoking may proceed at an elevated humidity of up to 70-80 %. At this stage further consolidation of the crust occurs and the crust becomes colored under the effect of the smoke components.

In contrast to collagen casings, where the temperature of thermal processing must not exceed 70°C - 75°C, otherwise such casings begin to decompose, the products in the **FIBROSMOK** casing can be cooked ready for consumption at the temperature of 80°C (if the speck used is not easy-melting).

After completion of the cooking process, it is also recommended to carry out a short drying during 10-15 minutes at a temperature of 65-70°C.

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

It should be noted that in order to obtain the traditional sensory characteristics of the products in the **FIBROSMOK** casing by thermal processing, the thermal conditions must be adjusted, in contrast to collagen and viscose-reinforced casings.

The first step must include an additional drying stage for a smoother raising of the temperature of the heating medium, and of the product core temperature.

At the stage of smoking the temperature must be higher (by 5°C) and the required time, which depends on the chamber design, may have to be increased by 10 to 30 minutes.

It has been proved in practice that the thermal processing losses of the products in the **FIBROSMOK** casing are 2-2.5 times less compared with collagen and viscose-reinforced casings.

See the following comparative Table for thermal processing characteristics of the **FIBROSMOK** casing versus collagen and viscose-reinforced casings :

Two-frame Termostar chamber, beech chips

Process stage	Casing name		
	FIBROSMOK	**Belcosin**	**Fibrose**
Drying	55˚C -15 min	55˚C - 20 min	55˚C - 10 min.
Drying	65˚C -15 min	-	60˚C - 10 min.
Smoking	65˚C-30 min humidity= 50%	60˚C - 50 min.	65˚C - 30 min.
Smoking	70˚C-20 min.– humidity = 70%	-	70˚C - 35 min.
Smoking	75˚C-30 min.– humidity = 75%	-	-
Cooking	80˚C to 72˚C in the chub core	75˚C to 72˚C in the chub core	75˚C to 72˚C in the chub core
Drying	65˚C -15 min.	-	-
Thermal processing losses	1.8%	7%	5%
Total time	2 hrs 25 min.	1 hr 50 min.	2 hrs 05 min.

4.6. Cooling

Upon completion of the thermal processing, the sausages in the **FIBROSMOK** casing must be immediately cooled. Cooling can be carried out under running water or shower, or by means of spraying, 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.

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.
The guarantee term for the R2U (ready to use) casing is 3 months from manufacture subject to integrity of the manufacturer's packing. Upon expiration of the above period of time the casing can be processed subject to pre-soaking.

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