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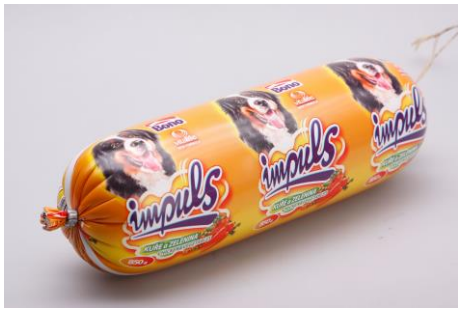
Casings AMITEX

AMITEX Elite-S

Process Operating Manual



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1. APPLICATION

This Process Operating Manual describes the process of production of sterilized and pasteurized sausage and ham products, as well as spreads and liver sausages packaged into the **AMITEX Elite-S** casing.

AMITEX Elite-S is a seven-layer plastic casing made of polyamide, polyolefin, and an adhesive (modified polyethylene) permitted for use in the food industry. The quality of the raw materials used to manufacture the **AMITEX Elite-S** casing is confirmed by Russian and international quality certificates.

The **AMITEX Elite-S** casing is made and is designed for production of packaged pasteurized and sterilized products with a long shelf life (sausages, spreads and other products).

Features of the **AMITEX Elite-S** casing:

- it is made of polymers with a low permeability to gases, in particular, oxygen;
- it has a high heat resistance value (the casing withstands thermal processing at temperatures of up to 125°C).

The product thermal processing (sterilization) conditions in combination with the barrier properties of the **AMITEX Elite-S** casing itself makes it possible to obtain products that preserve, for a long time, excellent consumer qualities (freshness, taste, smell, appearance).

The **AMITEX Elite-S** casing is intended, above all, for retail trade products sold as whole chubs.

The shelf life and storage conditions for the products sterilized in the **AMITEX Elite-S** casing depend on the sterilization conditions (the temperature and duration of sterilization).

The shelf life of the products made by the traditional thermal processing methods (pasteurization) can be extended to 90 days.

2. ADVANTAGES

2.1. Specifications of the casing

2.1 High rupture strength is important in cases where the chubs are molded with the use of high-capacity automatic or semi-automatic clippers, and allows the casing to withstand the loads of sterilization and preserve the shape of the product.

2.2 Caliber consistency plays an important role in the production of portion products with a fixed weight.

2.3 High heat resistance of the polymers used for production of the **AMITEX Elite-S** casing raises the temperature limits of use of the casing up to 125°C, which distinguishes the **AMITEX Elite-S** casing from other multilayer plastic casings. This makes it possible to sterilize meat products.

2.4 Low permeability to oxygen inhibits the processes of oxidation of fats and vitamins, and forms the basis for microbiological stability of products with a long shelf life.

2.5 Low permeability to water vapor provides for the following advantages of the casing:

- zero losses during the thermal processing and storage of meat and sausage products, and an excellent selling appearance (no wrinkles) of the finished products throughout the shelf life.

2.6 The casing is immune to microbiological damage, since the materials used to make the **AMITEX Elite-S** casing are inert to the action of bacteria and mold fungi. This facilitates storage of the casing and improves the hygienic characteristics of both the casing itself, and of the sausage production.

2.7 The **AMITEX Elite-S** casing has a number of significant **engineering and economic advantages** over other types of packaging (glass jars and metal cans) used for sterilized products:

- wide assortment of calibers, which makes it possible to package portion products in different weights;
- wide range of colors, and possibility of printing on the casing;
- no sealing seam;
- no internal or external corrosion;
- excellent thermal physical characteristics, minimal weight of packaging;
- easy disposal of wastes and environmental safety of the **AMITEX Elite-S** casing;
- easy opening of the packaging.

3. ASSORTMENT OF PRODUCTS

Casing calibers: 35 – 120 mm.

Colors of the **AMITEX Elite-S** casing: clear, white, brown, red, gold, light gold, dark gold, bronze, cream, yellow, black.

The casing can be used for single- or double-sided printing in multicolor or full color, with the use of UV-cured inks.

The casing can be supplied in:

- rolls;
- shirred sticks;
-shirred sticks R2U (ready-to-use).

4. CASING USE TECHNOLOGY

4.1. Storage and transportation of casing

4.1.1. The casing must be stored in the original packing in dry, clean, and cool rooms (at a temperature from 5 to 35°C, and air relative humidity not more than 80%) conforming to the sanitary-hygienic standards for the meat processing industry.

4.1.2. It is recommended to open the manufacturer's packing just immediately before use of the casing.

4.1.3. During storage and transportation, protect the casing against exposure to high temperatures (above 40 °C) or direct sunlight.

4.1.4 If the casing was stored at a temperature below 0°C, then prior to use keep it in its original packing at room temperature for at least 24 hours.

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

4.1.6 Throughout the technological cycle it is important to protect the casing from damages.

4.2. Preparation of the casing for use

To impart elasticity to the casing and provide for uniform stuffing, pre-soak the **AMITEX Elite-S** casing in potable water at a temperature of 20 – 25 °C.

Water must penetrate the tube and wet both the outer and the inner surface of the casing.

Unshirred casings must be cut into sections of required length before soaking. Keep the spool vertical throughout the unwinding to avoid damaging the ends.

Soak shirred casings without removing the net.

Casing soaking time:

- not less than 30 minutes for casings cut into lengths;

- not less than 60 minutes for shirred casings.

If too much casing was soaked, remove it from water, drain the excessive water and leave the wet casing away from any sources of heat or air draft. On the next day, soak the casing again before processing.

Never soak the casing in hot water, because this may start a process of uncontrolled longitudinal and transverse shrinkage leading to reduction of the length and caliber of the casing.

4.3. Preparation of the stuffing

The composition of the emulsion for production of cooked sausages, hams, spreads, liver sausages and other products shall be based on the moisture resistance properties of the casing.

The quality and safety of sausage products with a long shelf life heavily depend on the properties of the raw materials and additives used.

All efforts must be made to prevent contamination with disease or deterioration agents. The raw materials must contain as few microorganisms as possible, therefore the preparation and processing of the raw materials must be performed fast, at low temperatures, and in compliance with all hygienic requirements for bacterially safe meat. The content of spores in spices and other additives must also be taken into consideration.

4.4. Molding of sausage products

The **AMITEX Elite-S** casing is intended for use on automatic or semi-automatic filling and clipping equipment.

To avoid damaging the casing, make sure that there are no burrs on the contacting parts of the equipment.

Never puncture the chubs (perforate the casing). The casing will rupture, if punctured.

During the molding of sausage products, avoid trapping of air in the casing.

For production of pasteurized sausages, the overstuffing of the casing relative to the nominal caliber should be 10% on the average.

For sterilized products, the overstuffing for the **AMITEX Elite-S** casing should be reduced to 6 – 8%.

The clips used must provide for secure holding of the chub ends and withstand sterilization and cooling, without damaging the casing. Compliance with this requirement will exclude recontamination of the product packed into the **AMITEX Elite-S** casing at the stages of cooling and storage. To ensure the secure fastening of the clips, adhere to the recommendations on the use of the clips (see Table 1).

After stuffing of the chubs with emulsion, proceed with thermal processing as soon as possible.

Recommended clip types

Table 1

Caliber	POLY-CLIP		TECHNOPACK		COMPO	TIPPER TIE	Corund
	Clip interval 15 interval 18	Clip series S	Clip series E	Clip series G	Clip series B	Clip interval 15 interval 18	Clip
45-50	15-7-4×1.25 15-7-5×1.5 18-7-5×1.75	628	210 212	175	B1 B2	15-7-5×1.5 18-7-5×1.75	E210 2.5x13.6x14
55 - 60	15-7-5×1.5 15-8-5×1.75 18-7-5×1.75	628 632 735	212 410	175 370	B2	15-7-5×1.5 15-8-5×1.75 18-7-5×1.75	E 212 E 220 2.5x13.6x14
65-70	15-7-5×1.5 15-8-5×1.75 18-7-5×1.75	628 632 735	212 410	175 370	B2	15-7-5×1.5 15-8-5×1.75 18-7-5×1.75	E 212 E 220 2.5x13.6x14
75-80	15-8-5×1,5 15-8-5×1.75 15-9-5×1.75 18-9-5×2.0	632 638 735 844	212 222 410	175 200 370	B2 B3	15-8-5×1.75 15-9-5×1.75 18-9-5×2.0	E 222 2.5x13.6x14 2.5x13.6x15
85-100	15-9-5×1.5 15-10-5×2.0 18-9-5×2.0 18-10-5×2.5	632 638 740 844	222 410	200 370 390		15-9-5×1.5 15-10-5×2.0 18-9-5×2.0 18-10-5×2.5	E 222 2.5x13.6x15 2.5x13.6x16
105-120	15-10-5×2.0 15-11-5×2.0 18-10-5×2.5 18-11-5×2.0	740 744 844	222 232 410 420	200 225 370 390		15-10-5×2.0 15-11-5×2.0 18-10-5×2.5 18-11-5×2.0	E 222 2.5x13.6x15 2.5x13.6x16

Note. The POLY-CLIP FCA 3430, 3441, 3442, 3451, 3461, 3462, 3463 and TIPPER TIE TT1815, TT1512, SVF 1800 clippers use blocks, each of which corresponds to a certain clip type indicated in the Table. In order to determine whether the clip matches the block, see recommendations of the manufacturer and the technical description of the clipper.

4.5. Thermal processing
4.5.1. Sterilization of products

Selection of the conditions for sterilization of the products in the **AMITEX Elite-S** casing must be primarily based on the design features and capacities of the autoclave, and the size of the product to be sterilized (its caliber and weight). Selection of the temperature and duration of sterilization is determined by the required storage terms and the initial bacterial count of the product.

The heating must be adequate for deactivation of all spores present in the product. The spore-generating microorganisms that survive the sterilization will be inhibited during the storage by such barriers as the low pH of the product, the low redox potential provided by the **AMITEX Elite-S** casing, the concentration of nitrite, salt, etc.

Batch-type upright grid autoclaves are the most suitable for sterilization of products in plastic packaging.

Baskets with chubs are loaded into the autoclave filled with water (the water temperature must be 15 – 20°C higher than that of the product to be sterilized) to a level sufficient to cover the top layer of the chubs. The temperature and pressure in the autoclave are then gradually raised to the values required by the sterilization formula, within the time specified in the sterilization formula.

Sterilization proper starts after the temperature and pressure specified in the sterilization formula have been reached in the autoclave.

The duration of sterilization of packaged products is 20 – 40 minutes at a temperature of 103 – 125°C and strictly controlled counterpressure (1.8 – 2.7 bar).

Cooling must be performed in a rapid and hygienic manner, therefore the cooling time and the cooling water quality are of critical importance.

Cooling must be carried out in the conditions of counterpressure, and only after the cooling can the pressure be reduced to the atmospheric value, and the autoclave can be opened. Cooling shall be deemed completed, when the temperature of the product has reached 25 – 30°C.

The products must be stored at a temperature within the range predetermined by the heating.

4.5.2. Pasteurization of products

Thermal processing of pasteurized products in the **AMITEX Elite-S** casing consists in cooking and cooling. The technological stages of drying and roasting can be disposed with.

Thermal processing of sausages can be carried out in heat chambers of various types, and in stationary boiling cauldrons.

For the purposes of thermal processing in heat chambers, it is recommended to use either staged cooking, or delta cooking. In either case, cooking should start at a temperature of 50-55°C to trigger the coloring reactions. Higher starting temperatures may cause separation of the emulsion and color defects (grey rings).

Staged cooking consists in step-by-step raising of the temperature in the heat chamber, as the temperature in the center of the product reaches the temperature of the heating medium. The number of 'stages' is determined by the product diameter– the greater the caliber, the greater is the number of the stages. The first stages consist in heating at moderate temperatures – 50, 60, 70 °C to ensure slow coagulation of proteins and redistribution of heat throughout the volume. The last stage is bringing of the product to consumption readiness (72 °C in the chub core, during 10 - 15 minutes).

Delta cooking creates more favorable conditions for uniform heating of sausages. The difference between the chamber temperature and the product temperature at the beginning of the process is 15 – 20 °C, reducing to 5 - 8 °C by the end of the process. Delta cooking in production conditions requires a longer heating, but yields higher quality products. The duration of cooking depends on the consumption readiness point of the product (72 °C in the chub core, during 10 - 15 minutes).

The following is an example of thermal processing for 60mm caliber sausage chubs:

- 55°C in heat chamber at 100% humidity - 15 minutes.
- 65°C in heat chamber at 100% humidity - 15 minutes.
- 75°C in heat chamber at 100% humidity - 25 minutes, or until 60°C in chub core is reached.
- 80°C in heat chamber at 100% humidity, until 72°C in chub core is reached.

For cooking in cauldrons it is recommended to:

- load the chubs in the water at a temperature of 55 – 60 °C, in order to prevent the uncontrollable shrinkage and deformation of the chubs;
- keep the sausages underwater, and move them for uniform cooking;
- before loading of each new batch of sausages, reduce the water temperature in the cauldron to 60°C.

Upon completion of the cooking process, the sausages must be immediately cooled. The first stage of cooling is spraying with cold water (time-delayed sprayers may be used) to bring the chub center temperature down to 25 - 35° C. After spraying, the sausage must be air-dried before putting it into a cold store.

Cold air cooling is undesirable. Exclude any exposure of the finished products to air drafts until complete cooling of sausages, because this may cause wrinkles on the surface.

4.6. Transportation and storage of sausages

Transportation and storage of sausages produced in **AMITEX Elite-S** are made subject to compliance with the technical documentations for this production.

5. MANUFACTURER'S GUARANTEES

5.1. 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, and preservation of the integrity of the original packing.

5.2. The shelf life of the casing is 3 years from manufacture; the shelf life of the casing with UV-printing is 2 years from manufacture; the shelf life of the casing with a R2U option is 6 months from manufacture (if the R2U casing, which is ready to use, has not been used within 6 months, it still can be processed in accordance with the requirements of this Process Operating Manual after the standard soaking procedure).

6. APPENDICES

6.1. No appendices in this document.

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