ATLANTIS-PAK

Leader In Innovative
Packaging Solutions

Casings

AMIFLEX Te
AMIFLEX Ta

Process Operating Manual

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1. APPLICATION

This Process Operating Manual describes the process of production of cooked sausage and ham products, as well as spreads and liver sausages with the use of the **AMIFLEX Te** and **AMIFLEX Ta** casings.
AMIFLEX Te and **AMIFLEX Ta** are multilayer casings made of polyamide, polyolefin and an adhesive (modified polyethylene), permitted for use in the food industry. The quality of the raw materials used for production of the **AMIFLEX Te** and **AMIFLEX Ta** casings is confirmed by Russian and international quality certificates.
The **AMIFLEX Te** and **AMIFLEX Ta** casings intended for production, transportation, storage and sale of:

- cooked sausage and ham products;
- blood and liver sausages, and spreads;
- brawns, aspic and jellied products;
- processed cheeses;
- food animal fats, margarines, and sour milk products (sour cream, cottage cheese);
- frozen products (minced sausage and meat, ice cream, dough)
- other food products.

The distinctive features of the **AMIFLEX Te** and **AMIFLEX Ta** casings are:

- enhanced rigidity, i.e. resistance to deformations;
- a glossy surface.

The **AMIFLEX Te** casing is intended for products sold in retail trading in the form of whole chubs.

The **AMIFLEX Ta** casing peels in a spiral, which makes it possible to slice encased chubs in the retail trading without longitudinal ruptures.

The **AMIFLEX Te** and **AMIFLEX Ta** casings are designed for products intended for retail sale in the form of whole chubs.

2. PROPERTIES and ADVANTAGES

2.1 Mechanical strength of the casing makes it possible to mold the chubs with the use of high-capacity automatic or semi-automatic clippers to ensure stability of the shape and fixed weight of the chubs at high rates of molding.

2.2 Enhanced rigidity of the casing makes it possible to use it for the products rich in plant meat replacements, which have a high thermal expansion coefficient, and provides for resistance to sharp changes in the heating medium temperature during the thermal processing.

2.3 Low permeability to oxygen and water vapor ensured by a carefully selected combination of polymers, which provides for the following advantages of the **AMIFLEX Te** and **AMIFLEX Ta** casings:

- zero losses during the thermal processing and storage of meat and sausage products;
- microbiological stability of the products during storage;
- retardation of the oxidation processes that cause rancidification of fats and changes in the natural color of the meat product;
- excellent selling appearance (no wrinkles) of the finished products throughout the shelf life.

2.4 Physiological safety- the **AMIFLEX Te** and **AMIFLEX Ta** casings are impervious to microbiological degradation, because the materials used for their production 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.

3. ASSORTMENT OF PRODUCTS

Calibers of the casing, mm
AMIFLEX Te 35-130
AMIFLEX Ta : 35- 120

See the available colors of the **AMIFLEX Te** and **AMIFLEX Ta** casings in the Catalogue of Colors.

Casings in bespoke colors can be supplied.

The **AMIFLEX Te** and **AMIFLEX Ta** casings can be used for single- or double-sided marking in a single color, multicolor or CMYK printing with the use of UV cured inks.

The casing can be supplied in:

- rolls;
- shirred sticks.

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.

4.1.7. The transporting shell should be at a temperature of no higher than +40 ° C.

4.2. Preparation of the casing for use

To impart elasticity to the casing and provide for uniform stuffing, the **AMIFLEX Te** and **AMIFLEX Ta** casings should be pre-soaked in potable water at a temperature of 20 – 25°C.

Make sure that the water penetrates inside the tube and wets not only the outer, but also 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.

Do not soak the casing in hot water to avoid uncontrollable longitudinal and transverse shrinkage leading to reduction of the casing length and caliber.

4.3. Preparation of the stuffing

During the thermal processing the sausage batter inside the **AMIFLEX Te** and **AMIFLEX Ta** casings does not lose moisture, therefore the calculation of the amount of water added to the batter at the stage of cutting shall be made on the basis of the moisture resistance properties of the casing.

In the development of new recipes, determine the quantity of the added moisture with regard to the moisture-retaining properties of the additives (emulsifiers, stabilizers, gelling agents, plant proteins, etc.), the raw meat quality, and the technical condition of the equipment, paying special attention to optimal binding of proteins, fats, and water.

All technological measures aimed at increased binding of water (raising of the yield) lead to raising of the pressure in the batter during the thermal processing. Batter with an elevated percentage of meat substitutes tends to swell more. In order to preserve the ability of the batter to bind significant amounts of water and to prevent rupture of the casing during the thermal processing, it is recommended to introduce all water-binding additives into the cutter not in a dry form, but in the form of jellies or emulsions.

The batter for hams, spreads, and liver sausages must be prepared in accordance with the regulatory documentation applicable to these products.

4.4. Molding of sausage products

The **AMIFLEX Te** and **AMIFLEX Ta** casings are designed for automatic or semi-automatic stuffing and clipping equipment.

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

To provide for a good appearance of the finished products, increased holding capacity of the casing, and reduction of the risk of water and fat pockets,

- the **AMIFLEX Te** casings should be filled with sausage emulsion **with 5 - 6% overstuffing**;

- the **AMIFLEX Ta** casings should be filled with sausage emulsion **with 12 - 14% overstuffing**;

During the molding it should be borne in mind that the difference between the nominal caliber of the casing and the stuffed caliber depends not only on the properties of the casing, but also on the emulsion consistence and temperature, the stuffing pressure, and the conditions of cooling after thermal processing. Thus, if the emulsion has a good binding or swelling capacity, it is recommended to reduce the casing overstuffing relative to the nominal caliber to avoid rupture of the casing during thermal processing.

For production of spreads by the hot method, when the emulsion is liquid and its temperature exceeds 40°C, the overstuffing relative to the nominal caliber should be increased by 3–5% in excess of that recommended for cooked sausages.

The clip must securely hold the ends of the chub, without damaging the casing. Observe the recommendations of the clipping equipment manufacturer to ensure tightness of clipping. See Table for recommendations on selection of the clips for the **AMIFLEX Te** and **AMIFLEX Ta** casings.

Table 1

Recommended clip types

Caliber	POLY-CLIP		TIPPER TIE	TECHNOPACK		COMPO	CORUND
	Clip interval 12 interval 15 interval 18	Clip series S	Clip interval 12 interval 15 interval 18	Clip series E	Clip series G	Clip series B, BP	Clip
25-50	12-6-4×1.25 15-7-5×1.5 18-7-5×1.75	625 628 735	12/6-4×1.25 15/7-5×1.5 18/7-5×1.75	210 410	175	B 1, BP 2	XE210 2,5x13,6x14
55 - 60	15-7-5×1.5 15-8-5×1.75 18-7-5×1.75	628 632 735	15/7-5×1.5 15/8-5×1.75 18/7-5×1.75	210 410	175 370	B 2, BP 2	XE 210 XE 220 2,5x13,6x14
65-70	15-8-5×1.5 18-7-5×1.5 18-9-5×2.0	628 632 735	15/8-5×1.5 18/7-5×1.5 18/9-5×2.0	210 220 410	175 370	B 2, BP 2	XE 220 2,5x13,6x14 2,5x13,6x15
75-80	15-8-5×1.5 15-9-5×1.5 18-9-5×2.0	632 638 735 844	15/8-5×1.5 15/9-5×1.5 18/9-5×2.0	220 410 420	175 200 370	B 2, BP 2 B 3, BP 3	XE 220 2,5x13,6x15 2,5x13,6x16
85-100	15-9-5×1.5 15-10-5×2.0 18-9-5×2.0 18-10-5×2.5	740 844	15/9-5×1.5 15/10-5×2.0 18/9-5×2.0 18/10-5×2.5	220 420	200 370 390	-	XE 220 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	15/10-5×2.0 15/11-5×2.0 18/10-5×2.5 18/11-5×2.0	220 230 420	200 225 370 390	-	-

Note. The POLY-CLIP FCA and TIPPER TIE TT1815, TT1512 and COMPO CN-501 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

Thermal processing of sausages in the **AMIFLEX Te** and **AMIFLEX Ta** casings consists in cooking and cooling.

Thermal processing of sausages can be made in heat chambers of various types, or in stationary boiling cauldrons.

4.5.1. Cooking

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.

4.5.2. Cooling

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 core 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 not allowed. Exclude any exposure of the finished products to air drafts until completely cooled, because this may cause wrinkles on the surface.

4.6. Transportation and storage of sausage products

Transportation and storage of sausage products manufactured with the use of the **AMIFLEX Te** and **AMIFLEX Ta** casings shall be in accordance with the regulatory documentation for these products.

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 **AMIFLEX Te** is 3 years from manufacture subject to compliance with the required technical conditions. The shelf life of the casing **AMIFLEX Te** with UV-printing is 2 years from manufacture subject to compliance with the required technical conditions.

5.3. The shelf life of the casing **AMIFLEX Ta** is 2 years from manufacture subject to compliance with the required technical conditions. The shelf life of the casing **AMIFLEX Ta** with UV-printing is 1 years from manufacture subject to compliance with the required technical conditions.

6. APPENDICES

6.1. No appendices in this document.

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