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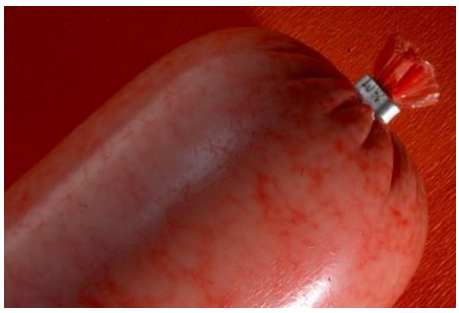
Casings EXTRAFLEX

EXTRAFLEX E

Process Operating Manual



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www.atlantis-pak.top
info@atlantis-pak.top

1. APPLICATION

This Process Operating Manual describes the manufacturing process for cooked sausages and hams, as well as spreads and liver sausages packaged in the **EXTRAFLEX E** casings.

EXTRAFLEX E is a multilayer casing made of polyamide, polyolefin and adhesive (modified polyethylene) permitted for use in the food industry by the Ministry of Health of the Russian Federation. The quality of the raw materials used to produce the **EXTRAFLEX E** multilayer casing is confirmed by Russian and international quality certificates.

The **EXTRAFLEX E** casing is made according to Specifications TU 22.21.29-017-27147091-2006 (equivalent to TU 2290-017-27147091-2006).

The recommended shelf life for cooked sausages in the **EXTRAFLEX E** casing is 60 days at a storage temperature between 0 and 6°C and the air relative humidity not exceeding 75 %.

The distinctive feature of the **EXTRAFLEX E casing is its enhanced elasticity**, which allows forming with the net on and manufacturing of products shaped like a Rugby football.

2. PROPERTIES AND ADVANTAGES OF THE EXTRAFLEX E CASING

2.1. High mechanical strength of the casing makes it possible to form 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 forming rates.

2.2. Elasticity of the casing in combination with its **heat shrink capacity** yields chubs with a smooth surface.

2.3. Low OTR and WVTR are ensured by the meticulously selected combination of polymers, and provides for the following advantages of the **EXTRAFLEX E** 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 **EXTRAFLEX E** casings are proof to microbiological damage, because the materials used for their production are inert to the action of bacteria and mold fungi. This facilitates the storage of the casings and improves the hygienic characteristics, both of the casing itself, and of the sausage production environment.

See the technical characteristics of the **EXTRAFLEX E** casing in the product specification and in TU 22.21.29-017-27147091-2006.

3. ASSORTMENT OF PRODUCTS

Calibers of the **EXTRAFLEX E** casing: 35–100mm.

Colors of the **EXTRAFLEX E** casing: see the Catalogue of Colors.

The **EXTRAFLEX E** casing can be printed on one side or both sides in single color, multicolor or CMYK with volatile solvent-based inks. Printing is applied by the flexographic method.

Forms of supply:

– reels;

– sticks of shirred casing.

4. HOW TO USE THE CASING

4.1. Storage and transportation of the casing

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

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

4.1.3. During storage and transportation, protect the casing against exposure to high temperatures or direct sunlight.

4.1.4. If the casing was stored at a subzero temperature, then prior to use hold 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. Take care not to damage the casing throughout the entire process cycle.

4.2. Preparation of the casing for processing

To provide for elasticity and uniform stuffing of the **EXTRAFLEX E** casing, presoak it in potable water (GOST R 51232-98) at the temperature of 20–25 °C.

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

The shirred casing should be soaked without removing the net.

Casing soaking time:

– not less than 30 minutes for casings cut into lengths; water must penetrate the tube and wet both the external surface and the inside of the tube;

– not less than 60 minutes for shirred casings.

If too much casing was soaked, take it out, drain the excessive water and leave the wet casing away from any sources of heat or air draughts. On the next day, re-soak the casing before processing.

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

4.3. Preparation of the forcemeat

During the thermal processing the sausage forcemeat inside the **EXTRAFLEX E** casing does not lose moisture, therefore the amount of water added to the forcemeat at the stage of cutting shall be calculated on the basis of the moisture resistance properties of the casing.

When sausages are made according to GOST 23670-2019, it is advisable to reduce the quantity of added moisture on the average by 10% of the forcemeat weight, compared with the recipes used for natural, collagen or viscose-reinforced casings.

For the development of new recipes, determine the quantity of 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 a growth of the pressure in the forcemeat during the thermal processing. Forcemeats with an elevated percentage of meat substitutes tend to swell more. In order to preserve the forcemeat's capacity of binding significant amounts of water and to prevent bursting 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.

Forcemeats for hams, spreads and liver sausages shall be prepared in accordance with the regulatory documentation for such products.

4.4. Forming of sausage products

The **EXTRAFLEX E** casing is designed for automatic and semiautomatic stuffing and clipping equipment, but is also suitable for manual tying.

Never prick the chubs (puncture the casing). The casing will burst, if punctured.

To provide for a good appearance of the finished products, increase the holding capacity of the casing, and to reduce the risk of fat and water pockets, it is recommended to overfill the **EXTRAFLEX E** casing with the sausage forcemeat **by 25-30%**. During the forming 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 itself, but also on the forcemeat consistency

and temperature, the stuffing pressure, and the conditions of cooling after the thermal processing. Thus, if the forcemeat has a high binding or swelling capacity, it is recommended to somewhat reduce the percentage of overfilling relative to the nominal casing caliber to avoid ruptures of the casing during the thermal processing.

When a shirred casing is used, take care to match the stuffer horn diameter with the internal diameter of the shirred tube: the shirred tube must freely pass onto the stuffer horn, while the difference between the shirred tube internal diameter and the horn external diameter must be as small as possible to mitigate the structural changes in the meat emulsion matrix. See the recommended horn sizes in Table 1.

Table 1 - Recommended horn sizes

Casing diameter	Shirring tube size, mm	Recommended external diameter of the stuffer horn, mm
35 - 37	26	20, 22
38 - 44	28	22, 24
45 - 53	32	24, 28
54 - 69	40	28, 36
70 - 79	52	36, 48
80 - 87	61	48
88 - 99	71	60
100	81	60

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 2 for recommendations on selection of the clips for the **EXTRAFLEX E** casing.

Table 2 - Recommended clip types

Caliber	POLY-CLIP			TIPPER TIE	TECHNOPACK		COMPO
	Clip step 15 step 18	Clip series S	R-ID clip	Clip step 15 step 18	Clip series E	Clip series G	Clip series B, BP
35 - 40	15-7-5×1.5 18-7-5×1.75 15-8-5×1.75	625 628 735	M07-150 L07-175 M08-175	15 /7-5×1.5 18 /7-5×1.75 15 /8-5×1.5	210 410	175 370	B 1, BP 1 B 2, BP 2
45 - 50	15-7-5×1.5 15-8-5×1.75 18-7-5×1.5	628 735	M07-150 M08-175 L07-150	15 /7-5×1.5 15 /8-5×1.5 18 /7-5×1.75	210 410	175 370	B 2, BP 2
55 - 60	15-7-5×1.5 15-8-5×1.75 18-7-5×1.5	628 632 735	M07-150 M08-175 L07-150	15 /7-5×1.5 15 /8-5×1.75 18 /7-5×1.75	210 410	175 370	B 2, BP 2
65 - 70	15-8-5×1.5 18-7-5×1.5	628 632 735	M08-150 L07-150 L07-225	15 /8-5×1.75 18 /7-5×1.75	210 220 410	175 370	B 2, BP 2

75 - 80	15-9-5×1.75 18-9-5×2.0	632 638 735 844	M09-175 L09-200	15 /9-5×1.75 18 /9-5×2.0	220 410 420	175 200 370	B 2, BP 2 B3, BP3
85 - 105	15-10-5×2.0 18-9-5×2.0 18-10-5×2.5	740 844	M10-200 L09-200 L10-250	15 /10-5×2.0 18 /9-5×2.0 18 /10-5×2.5	220 420	200 370	-

Note: The POLY-CLIP FCA 3430, 3430-18, 3463, FCA 80, 100, 120, 140, 160, ICA 8700 and ALPINA Swipper/TT 18/15, 15/12 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 **EXTRAFLEX E** casing consists in cooking and cooling. The stages of curing and roasting can be excluded from the technological process.

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

4.5.1. Cooking.

When processing in heat chambers, use either staged cooking, or delta cooking. In either case, start cooking at the temperature of 50 – 55 °C to trigger the coloring reactions. Higher starting temperatures may cause stratification 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 core 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 stages. The first stages consist in heating at moderate temperatures – 50, 60, 70 °C to ensure a 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 provides more favorable conditions for uniform heating of sausages. The difference between the chamber temperature and the product temperature in the beginning of the process should be 15 – 20 °C, decreasing 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 a heat chamber at 100% humidity - 15 minutes.

– 65 °C in a heat chamber at 100% humidity - 15 minutes.

– 75 °C in a heat chamber at 100% humidity - 25 minutes, or until 60 °C in the chub core is reached.

– 80 °C in a heat chamber at 100% humidity until 72 °C in the chub core is reached.

For cooking in cauldrons, it is recommended to:

– load the chubs in the water at the 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 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 transfer to the cold store.

Cold air cooling is undesirable. Avoid any exposure of the finished products to air draughts until completely cooled, because this may cause wrinkles on the surface.

4.6. Transportation and storage of the products

Transportation and storage of meat products made with the use of the **EXTRAFLEX E** casing must be in accordance with the applicable regulatory documentation (GOST, TU).

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 integrity of the original packing.

5.2. The shelf life of the **EXTRAFLEX E** casing is 3 years from the date of manufacture to the date of processing, subject to compliance with the requirements for transportation and storage at the user's warehouse, and provided that the manufacturer's packing remains intact.

6. DOCUMENTATION

6.1. This document is subject to mandatory review and, if needed, subsequent correction at three years after adoption or the latest amendment.

6.2. The annulled original document shall be kept in the library archive of the Company's electronic documents management system for 5 years.

ATLANTIS-PAK

PCF ATLANTIS-PAK LLC
Address: 72 Onuchkina str., village of Lenin,
Aksay district, Rostov region,
346703 Russian Federation
Phones: +7 863 255-85-85 / +7 863 261-85-80
Fax: +7 863 261-85-79
www.atlantis-pak.top
info@atlantis-pak.top

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