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AMITEX Rondo 1 casing

Process Operating Manual

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1. APPLICATION

The present Process Operating Manual describes the process of production of cooked sausages and hams, as well as spreads and liver sausages, with the use of the **AMITEX Rondo 1** casing.

AMITEX Rondo 1 is a seven-layer 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 Rondo 1** casing is confirmed by Russian and international quality certificates.

The **AMITEX Rondo 1** casing is designed for production, transportation, storage and sale of:

- traditional 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 feature of the **AMITEX Rondo 1** casing is its striking appearance achieved by means of an advanced extrusion technology. The seven-layer structure of the casing produces the decorative effect of a 3D lattice on the outer layer, without compromising the barrier and mechanical characteristics.

The **AMITEX Rondo 1** casing is designed for the products intended for retail trading in the form of whole chubs.

2. PROPERTIES AND ADVANTAGES

AMITEX Rondo 1 is a multilayer barrier casing and, therefore, possesses all properties of such casings, the most important of which are the following:

- **mechanical strength,** which 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;
- **high elasticity,** which provides for a significant overstuffing relative to the nominal diameter of the casing, which, in combination with the **heat-shrinking properties**, ensures the absence of wrinkles on the finished sausage products;
- **high tensile strength** due to the reinforcing effect of the 'textured' layer (the casing does not rupture longitudinally when the sausage chub is cut;

- **low permeability to oxygen and water vapor,** ensured by the carefully selected combination of polymers, which provides for the following advantages of the **AMITEX Rondo 1** casing:
  - 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.
- **physiological safety,** ensured by the fact that the **AMITEX Rondo 1** casing is impervious to microbiological degradation, because the materials used for its 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, and the sausage production.

The eye-catching appearance of the casing in combination with CMYK printing in UV-cured inks can be used as a distinctive attribute of a whole group of sausages to create a memorable image and set up of a corporate style of a meat processing company.

3. ASSORTMENT

AMITEX Rondo 1 casing calibers: 45 – 120 mm

Colors of the **AMITEX Rondo 1** casing: beige, white, clear, gold, gold 47, brown, red, cream, copper, orange, light gold, dark gold.

The **AMITEX Rondo 1** casing can be used for single- or double-sided marking in a single color, multicolor or CMYK printing with the use of UV cured inks.

Printing is applied by the flexographic method. The inks are resistant to boiling, fats, and mechanical action.

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 the 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%) complying 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 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 provide for elasticity and uniform stuffing of the casing, **AMITEX Rondo 1** should be pre-soaked in potable water with a temperature of 25 – 30 °C. The use of higher temperatures will cause an uncontrolled heat shrinkage of the casing and reduction of its length and caliber.

Take care to ensure 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 60 minutes for casings cut into lengths;
- not less than 90 minutes for shirred casings.

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

4.3. Preparation of the emulsion

During the thermal processing the sausage batter inside the **AMITEX Rondo 1** casing does not lose moisture, therefore the calculation of the amount of water added to the stuffing at the stage of cutting shall be made with regard to the moisture resistance properties of the casing.

For 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. This must be taken into account. In order to preserve the batter's ability to bind significant amounts of water and to prevent rupture of the casing during the thermal processing, it is recommended to introduce all 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 sausages

The **AMITEX Rondo 1** casing is designed for automatic or semi-automatic stuffing and clipping equipment.

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

To ensure a good appearance of the finished products, increase the holding capacity of the casing, and reduce the risk of fat and water pockets, the **AMITEX Rondo 1** casing should be filled with the sausage emulsion with **10 - 12% 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 high binding or swelling ability, it is recommended to somewhat reduce the percentage of overstuffing relative to the nominal caliber.

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 to 12–15%.

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 **AMITEX Rondo 1** casing.

Table 1

Recommended clip types

Caliber	POLY-CLIP		TIPPER TIE	TECHNOPACK		COMPO	CORUND
	Clip interval 15 interval 18	Clip series S	Clip interval 15 interval 18	Clip series E	Clip series G	Clip series B, BP	
45 - 50	15-7-5×1.5 15-8-5×1.75 18-7-5×1.5	628 735	15 /7-5×1.5 15 /8-5×1.5 18 /7-5×1.75	210 220 410	175 370	B 2, BP 2	XE 210 2.5x13.6x14
55 - 60	15-7-5×1.5 15-8-5×1.75 18-7-5×1.5	628 632 735	15 /7-5×1.5 15 /8-5×1.75 18 /7-5×1.75	210 220 410	175 370	B 2, BP 2	XE 220 2.5x13.6x14 2.5x13.6x15
65 - 70	15-8-5×1.5 18-7-5×1.5	628 632 735	15 /8-5×1.75 18 /7-5×1.75	220 410	175 370	B 2, BP 2	XE 220 2.5x13.6x15
75 - 80	15-9-5×1.75 18-9-5×2.0	632 638 735 844	15 /9-5×1.75 18 /9-5×2.0	220 410	175 200 370	B 2, BP 2 B3, BP3	XE 220 2.5x13.6x15 2.5x13.6x16
85 - 100	15-10-5×2.0 18-9-5×2.0 18-10-5×2.5	740 844	15 /10-5×2.0 18 /9-5×2.0 18 /10-5×2.5	220 420	200 370	-	XE 220 2.5x13.6x15 2.5x13.6x16
105-120	15-10-5×2.0 15 -11-5×2.0 18-11-5×2.0 18-12-5×2.2	740 744 844	15 /10-5×2.0 15 /11-5×2.0 18 /10-5×2.5 18 /12-5×2.5	220 230 420	200 225 370 390	-	-

Note. The POLY-CLIP FCA and TIPPER TIE TT1815, TT1512, SVF 1800 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 **AMITEX Rondo 1** casing consists in cooking and cooling. The technological stages of drying and roasting can be dispensed with.

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, it is recommended to use either staged cooking, or delta cooking. In either case, start cooking at a temperature of 50 – 55 °C

to trigger the coloring reactions. Higher starting temperatures may lead to stratification of the stuffed 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 'steps' is determined by the product diameter– the greater the caliber, the greater is the number of the steps. The first stages consist in heating at moderate temperatures – 50, 60, 70 °C to ensure slow coagulation of proteins and distribution of heat throughout the volume. The last stage is bringing of the product to consumption readiness (72 °C in the chub center 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 in 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 time required to achieve the consumption readiness of the product (72 °C in the chub center 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 - 25 minutes.
- 65 °C in a heat chamber at 100% humidity - 25 minutes.
- 75 °C in a heat chamber at 100% humidity - 35 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 going to 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 sausages

Transportation and storage of sausage products manufactured with the use of the **AMITEX Rondo 1** casing 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 specified 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 for the **AMITEX Rondo 1** casing is 3 years from manufacture.

5.3. The shelf life for the **AMITEX Rondo 1** casing with UV-printing is 2 years from manufacture.

5.4. The shelf life for the **AMITEX Rondo 1** casing in shirred sticks R2U 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).

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