



**ATLANTIS-PAK**

Leader In Innovative  
Packaging Solutions

**Casings**



# AMIFLEX-Mini

Process Operating Manual



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## 1. APPLICATION

The present Process Operating Manual describes the process of production of cooked sausages with the use of the **AMIFLEX-Mini** casing.

**AMIFLEX-Mini** is a multilayer 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 casing is confirmed by Russian and international quality certificates.

The **AMIFLEX-Mini** casing is made can be used for production, transportation, storage and sale of such food products as:

- emulsified cooked sausages;
- frankfurters and wieners;
- spreads, blood and liver sausages;
- processed cheeses;
- animal cooking fats, margarines, and sour milk products.

The distinguishing feature of the **AMIFLEX-Mini** casing is combination

of a multilayer structure and a small caliber, which makes it possible to manufacture small-portion products with a fixed weight (from 25 to 100 g) and an extended shelf life.

The recommended shelf life for sausages and frankfurters made in the **AMIFLEX-Mini** casing is not more than 30 days after completion of the technological process at a storage temperature from 0 to 6°C, and relative humidity of the air not more than 75%.

## 2. ADVANTAGES

### 2.1. Specifications of the casing

**AMIFLEX-Mini** casing is produced at modern equipment which provides:

- permanent control over all the parameters;
- extremely high level of manufacturing process automation.

Basic characteristics of quality parameters and test conditions of **AMIFLEX-Mini** casing of all types are included into Product Specifications.

## 2.2. Casing advantages

**AMIFLEX-Mini** is a multilayer barrier casing and, therefore, has all properties of such casings, the most important of which are the following:

- **mechanical strength**, which makes it possible to mold chubs with the use of high-capacity automatic and semi-automatic clippers to ensure stability of the shape and fixed weight of the chubs at high rates of molding;

- **low permeability to oxygen and water vapor**, which provides for zero losses during the thermal processing and storage of the products, microbiological stability during the storage period, retardation of the oxidation processes, and preservation of an excellent selling appearance throughout the shelf life;

- **physiological safety** due to the fact that the **AMIFLEX-Mini** casing is inert to the action of bacteria and mold fungi;

- the multilayer structure of the **AMIFLEX-Mini** casing makes it possible to produce a non-transparent casing by means of coloration of several layers. Such casing is not only glossier than the monolayer casings, but also provides a barrier to the photochemically active part of the spectrum, that causes rancidification of the fat components and discoloration of products.

## 3. ASSORTMENT OF PRODUCTS

Calibers of the casing: 19 – 40 mm.

Casing colors: clear, white, brown, cream, yellow, red, bronze, silver, dark gold, light gold, gold, orange. Bespoke colors can be ordered.

**AMIFLEX-Mini** can be used for single- or double-sided marking in a single color, multicolor or CMYK printing with the use of volatile solvents-based inks.

Ring shaped casings printing options:

- One side printing with positioning on “front side”
- Double side printing without positioning (in case of background printing on the original layout).

The casing can be supplied in shirred sticks.

Forms of production: straight or ring-shaped.

Table 1

Standard shirring parameters for the **AMIFLEX-Mini** casing

|              | Casing type | Casing diameter | Shirring type        | Length of shirred stick, mm | Length of casing in shirred stick, m |
|--------------|-------------|-----------------|----------------------|-----------------------------|--------------------------------------|
| Amiflex-Mini | Type R      | 21 - 32         | hard with open end   | 240 - 245                   | 25                                   |
| Amiflex-Mini | Type A      |                 | hard with closed end | 240 - 245                   | 25                                   |
| Amiflex-Mini | Type RKo    | 22, 24, 28      | soft with open end   | 240 - 245                   | 25                                   |
| Amiflex-Mini | Type AKo    |                 |                      | 240 - 245                   | 25                                   |
| Amiflex-Mini | Type Ko     | 32 - 38         |                      | 470                         | 31                                   |
| Amiflex-Mini |             | 29 - 32         |                      | 470                         | 31                                   |

## 4. CASING USE TECHNOLOGY

### 4.1. Storage and transportation of casing

4.1.1 The casing must be stored in its original packing in dry and clean rooms (at a temperature from 5 °C to 35 °C, and air relative humidity not higher 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 immediately before the processing of the casing.

4.1.3 During storage and transportation, do not expose the casing to high temperatures or direct sunlight.

4.1.4 If the casing was stored at a temperature below 0°C, then prior to use keep it at room temperature during at least 24 hours in the manufacturer's packing.

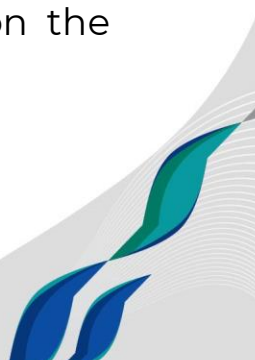
4.1.5 Never drop the cases containing the casing or subject them to impacts.

4.1.6 The casing must not be damaged throughout the technological cycle.

### 4.2. Preparation of the casing for use

The **AMIFLEX-Mini** casing intended for automatic frankfurter lines does not require any additional preparation (soaking) before stuffing.

The **AMIFLEX-Mini** casing intended for semi-automatic lines can be processed with or without pre-soaking, depending on the desired stuffed caliber and equipment capabilities.



The **AMIFLEX-Mini** casing intended for stuffers with twisting devices or for stuffing and clipping equipment required preliminary soaking.

Soak in potable water with a temperature of 20-25 °C during 20-30 minutes.

Never soak the casing in hot water to avoid premature shrinkage.

### 4.3. Preparation of the stuffing

The batter for production of cooked sausages, frankfurters, wieners, spreads and liver sausages in the **AMIFLEX-Mini** casing shall be prepared in accordance with the regulatory documents (GOST, TU) for these products.

It should be borne in mind that in the process of thermal processing, the sausage batter inside the **AMIFLEX-Mini** casing 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.

It is recommended to reduce the added moisture by 10% of the batter weight, on the average, as compared with the recipes for the natural, collagen, and viscose-reinforced casings.

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.

### 4.4. Molding of sausage products

Before processing, make sure that there are no burrs on the equipment parts or the work table surface.

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

To ensure a good appearance of the finished products and reduce the risk of water and fat pockets, the **AMIFLEX-Mini** casing should be filled with the following overstuffing:



- **3-5%** (without pre-soaking)
- **6-8%** (with pre-soaking).

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.

If spreads are made 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 5 - 10 %.

The rate of stuffing of the **AMIFLEX-Mini** casing should be determined with regard to the technical condition of the equipment. The desired molding parameters are achieved by adjustment of the molding equipment.

When stuffing the **AMIFLEX-Mini** casing, make sure that the casing diameter matches the stuffing horn diameter.

Table 2

Recommended parameters for processing of the **AMIFLEX-Mini** casing on automatic or semi-automatic lines

| Caliber of casing, mm | Recommended stuffed caliber, mm | Townsend automatic lines |                   | Handtmann and Vemag automatic lines, horn diameter, mm |
|-----------------------|---------------------------------|--------------------------|-------------------|--|
|                       |                                 | Horn No.                 | Horn diameter, mm |  |
| 19                    | 19,5 – 20,0                     | 10/11                    | 9,5               | 10   |
| 20                    | 20,5 – 21,0                     | 10/11                    | 9,5               | 11   |
| 21                    | 21,5 - 22                       | 13/14                    | 10,3/11,1         | 10 - 11  |
| 22                    | 22,5 - 23                       | 14/15/16                 | 11,1/11,9/12,7    | 11 - 12  |
| 23                    | 23,5 - 24                       | 14/15/16                 | 11,1/11,9/12,7    | 11 - 12  |
| 24                    | 24,5 - 25                       | 14/15/16                 | 11,1/11,9/12,7    | 11 - 12  |
| 25                    | 25,5 - 26                       | 14/15/16                 | 11,1/11,9/12,7    | 11 - 12  |
| 26                    | 26,5 - 27                       | 16/17/18                 | 12,7/13,5/14,3    | 13 - 14  |
| 27                    | 27,5 - 28                       | 16/17/18                 | 12,7/13,5/14,3    | 13 - 14  |
| 28                    | 29,5 - 30                       | 17/18                    | 13,5/14,3         | 14 - 16  |
| 29                    | 30 - 30,5                       | 17/18                    | 13,5/14,3         | 14 - 16  |
| 30                    | 31 – 31,5                       | 17/18                    | 13,5/14,3         | 14 - 16  |
| 31                    | 32 - 32,5                       | 18/19                    | 14,3/17,5         | 16 - 18  |
| 32                    | 33 - 33,5                       | 18/19                    | 14,3/17,5         | 16 - 18  |

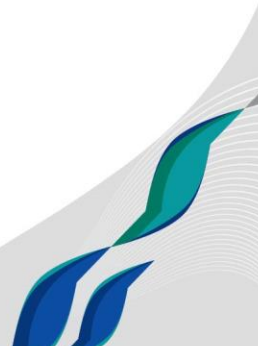


Table 3

Recommended molding parameters for processing of the **AMIFLEX-Mini** casing on twisting stuffers and clipping equipment

| Caliber of casing, mm | Shirring type | Recommended stuffed caliber, mm | Recommended horn diameter, mm |
|-----------------------|---------------|---------------------------------|-------------------------------|
| 19                    | Hard          | 20 - 20,5                       | 10 - 11                       |
| 20                    | Hard          | 21,0 - 21,5                     | 11 - 12                       |
| 21                    | Hard          | 22 - 22,5                       | 11 - 12                       |
| 22                    | Hard          | 23 - 23,5                       | 11 - 12                       |
| 23                    | Hard          | 24 - 24,5                       | 11 - 12                       |
| 24                    | Hard          | 25,5 - 26                       | 11 - 12                       |
| 25                    | Hard          | 26,5 - 27                       | 11 - 12                       |
| 26                    | Hard          | 27,5 - 28                       | 13 - 14                       |
| 27                    | Hard          | 28,5 - 29                       | 13 - 14                       |
| 28                    | Hard          | 29,5 - 30                       | 14 - 16                       |
| 29                    | Hard          | 30,5 - 31                       | 14 - 16                       |
| 30                    | Hard          | 31,5 - 32,0                     | 16 - 18                       |
| 31                    | Hard          | 32,5 - 33,5                     | 16 - 18                       |
| 32                    | Hard          | 34 - 34,5                       | 16 - 18                       |
| 29                    | Soft          | 30,5 - 31                       | 16 - 18                       |
| 30                    | Soft          | 31,5 - 32,0                     | 16 - 18                       |
| 31                    | Soft          | 32,5 - 33,5                     | 16 - 18                       |
| 32                    | Soft          | 34 - 34,5                       | 16 - 20                       |
| 34                    | Soft          | 36,0 - 36,5                     | 16 - 20                       |
| 36                    | Soft          | 38,0 - 38,                      | 16 - 20                       |
| 38                    | Soft          | 40,0 - 40,5                     | 16 - 20                       |
| 40                    | Soft          | 42,0 - 44,0                     | 16 - 20                       |

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 the recommendations on selection of the clips for **AMIFLEX-Mini** in Table 4.

Table 4

Recommended clip types

| Caliber, mm    | POLY-CLIP           |               | TIPPER TIE          | TECHNOPACK    |               | COMPO         |
|----------------|---------------------|---------------|---------------------|---------------|---------------|---------------|
|                | Clip interval 12/15 | Clip series S | Clip interval 12/15 | Clip series K | Clip series T | Clip series B |
| <b>19 - 25</b> | 12-6/4×1            | 524           | 12-4/3×1            | K-50          | T-100         | B1            |
|                | 12-6/4×1,25         | 526           | 12-5/4×1            | K-75          | T-120         | BP1           |
|                | 15-7/4×1,25         | 528           | 12-6/3×1,25         |               | T-150         |               |
| <b>25 - 32</b> | 12-6/4×1            | 524           | 12×6/4×1            | K-50          | T-100         | B1            |
|                | 12-6/4×1,25         | 526           | 12×6/4×1,25         | K-75          | T-120         | BP1           |
|                | 15-7/4×1,25         | 528           | 12×6/4×1,5          |               | T-150         |               |
| <b>34-40</b>   | 15-7/4×1,25         | 625           | 12×6/5×1,5          |               | T-120         |               |
|                | 18-5×1,5            | 625, 628      | 12-6/5×1,5          | K-75          | T-150         | BP1           |

Note: The POLY-CLIP FCA and TIPPER TIE TT1815, TT1512, SVF 1800 and COMPO KN-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 products in the **AMIFLEX-Mini** casing consists in cooking and cooling. The stages of drying and roasting can be excluded from the technological process.

Thermal processing of sausages can be carried out in heat chambers of various types, and in stationary 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 (68-72 °C in the chub center during 10 - 15 minutes).





The following is an example of thermal processing for caliber 24 products in the **AMIFLEX-Mini** casing:

- 55°C in heat chamber at 99% humidity - 10 minutes.
- 65°C in heat chamber at 99% humidity - 15 minutes.
- 75°C in heat chamber at 99% humidity - 15 minutes.
- 78°C in heat chamber at 99% humidity, until 72°C in chub core is reached.

#### **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 center temperature down to 25 - 35° C. After spraying, the sausage must be air-dried before going 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 sausage products manufactured with the use of the **AMIFLEX-Mini** 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 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.



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