



**ATLANTIS-PAK**

Leader In Innovative  
Packaging Solutions

Casings 

# AMILUX

Process Operating Manual



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## 1. APPLICATION

The **AMILUX** casing is a monolayer plastic casing permeable to process smoke and is intended for production of all types of frankfurters and wieners made by technological processes that involve the stage of smoking (smoke roasting), which makes it possible to obtain products with traditional sensory characteristics typical of products packaged in cellulose and synthetic collagen casings.

The **AMILUX** casing is made in accordance with the Specifications TU 2290-008-27147091-2000 from blends of high-quality synthetic and natural materials.

The **AMILUX** casing is covered by the State Registration Certificate No. RU.61.PL.10.019.E.000820.11.11 of 17.11.2011 issued by the Russian Agency for Protection of Consumers' Rights and Human Well-Being (Rospotrebnadzor).

The **AMILUX** casing is supplied straight or curved, thus providing for a wider assortment of products through diversity of appearance.

The recommended shelf life:

- for frankfurters packaged in the **AMILUX** casing according to GOST R 52196-2003 - not more than 7 days at the storage temperature from 2 to 6 °C and air relative humidity not more than 75%;
- for wieners packaged in the **AMILUX** casing according to GOST R 52196-2003 - not more than 9 days at the storage temperature from 2 to 6 °C and air relative humidity not more than 75%;

## 2. PROPERTIES AND ADVANTAGES

### 2.1. Specifications of the casing

2.1.1. The **AMILUX** casing is made on advanced equipment, which ensures:

- continuous control of all parameters;
- maximum automation of the production process

2.1.2. Basic quality characteristics and testing conditions for the **AMILUX** casing (see Table 1).



Table 1

Parameters	Values		Unit measure	Test methods	Test conditions
	<b>T</b>	<b>TL</b>			
Thickness, minimum maximum	16.0 23.0		μm		Schröder ball thickness gauge T=(25±2) °C, humidity=(60±5)% RH
Temperature range	From – 40°C to... +100 °C				
Water vapor transmission rate	370-600	320-500	g/m <sup>2</sup> * 24 hrs	Based on DIN 5312274	At T=30 °C, humidity=90% RH
Tensile strength, MD TD	15.0-25.0 17.0-30.0	16.0-27.0 17.0-30.0	kgf/mm <sup>2</sup>	GOST 1423681 (ST SEV 1490-79)	Shimadzu AGS H test machine, V=100mm/min, T=(25±2)°C, humidity=(60±5)% RH
Elongation at break, MD TD	60-180 65-150	70-180 65-150	%	GOST 1423681 (ST SEV 1490-79)	Shimadzu AGS H test machine, V=100mm/min, T=(25±2)°C, humidity=(60±5)% RH
Tube width tolerance, not more	2		%		Electronic control system

## 2.2. Advantages of the casing

2.2.1. The **AMILUX** smoke-permeable casing makes it possible to roast and smoke products to impart to them the characteristic pleasant smoked taste and flavor, and to create the coagulated protein crust and glossy surface of the products under the casing.

2.2.2. The high mechanical strength of **AMILUX** casing makes it possible to mold chubs not only by manual tying, but also by using various types of equipment to achieve a high rate of production with overstuffing relative to the nominal caliber. The caliber consistency in the **AMILUX** casings provides for stable filling on frankfurter lines and stuffer linkers.

2.2.3. The high oxygen barrier properties compared with cellulose casings provide for the following advantages:

- reduction of oxidation processes;
- preservation of the individual flavor of spices in the finished products throughout the shelf life.



2.2.4 Low permeability to water vapor. The **AMILUX** casing is an economical alternative to cellulose casings, because of lower moisture losses during the thermal processing and storage (it has been found in practice, that the thermal processing losses of the products in the **AMILUX T** casing are 1.5-2.0 times less in comparison with cellulose casings. The water vapor permeability of the **AMILUX** casing is 1.5 times lower than that of cellulose casings, and is at a level that makes it possible to:

- achieve the required degree of smoking of sausage products with the characteristic taste and flavor, and the coagulated protein crust on the surface;
- reduce moisture losses during the thermal processing and storage of frankfurters and wieners packaged in the **AMILUX** casing.

2.2.5. The high heat resistance of the polymers used to make the **AMILUX** casing significantly extends the temperature range of utilization of the casing in comparison with cellulose casings. The casing is stable at high temperatures.

2.2.6. Microbiological resistance. The materials used for production of the **AMILUX** casing are impervious to bacteria and mold fungi. This improves the hygienic characteristics of both the casing itself, and the finished products.

2.2.7. Reduced adhesion to different emulsions results in easy peeling of the casing off the finished product without damage to the surface layer of coagulated protein, which is especially important for frankfurters and wieners..

### 3. ASSORTMENT

**AMILUX T type A** has a closed end in the shirred stick; the casing is designed for use on automatic equipment;

**AMILUX TL type A** is an extra tough casing with a closed end in the shirred stick, and is also designed for use on automatic equipment;

**AMILUX T type Ako** is a curved casing with a closed end in the shirred stick, designed for use on automatic equipment;

**AMILUX TL type Ako** is a curved extra tough casing with a closed end in the shirred stick, designed for use on automatic equipment;

**AMILUX T type R** casing has a open end in the shirred stick and is designed for manual tying and use on stuffer linkers;



**AMILUX TL type R** is an extra tough casing with an open end in the shirred stick, and is designed for manual tying and use on stuffer linkers ; **AMILUX T type Rko** is a curved casing with an open end in the shirred stick, designed for manual tying and use on stuffer linkers;

**AMILUX T type Rko** is a curved casing with an open end in the shirred stick, designed for manual tying and use on stuffer linkers;

**AMILUX TL type Rko** is a curved extra tough casing with an open end in the shirred stick, designed for manual tying and use on stuffer linkers;

The **AMILUX** casing is supplied shirred. The parameters of the casing are shown in Table 2.

Table 2

Casing caliber, mm	Stick type	Shirring type	Length of casing in stick, m ( $\pm 2\%$ )
17	A/R	tight	25.0
18	A/R	tight	25.0
19	A/R	tight	25.0
20	A/R	tight	25.0
21	A/R	tight	25.0
22	A/R	tight	25.0
23	A/R	tight	25.0
24	A/R	tight	33.3
26	A/R	tight	33.3
32	A	tight	33.3
34	A	tight	33.3
32	R	loose	30.0
34	R	loose	50.0 (30.0)
38	R	loose	50.0 (30.0)
22	Ako/Rko	tight	25.0
24	Ako/Rko	tight	25.0
32	Rko	loose	30.0
34	Rko	loose	30.0
38	Rko	loose	30.0

Colors of the **AMILUX®** casing: clear, light smoke, smoke, orange, red orange, dark orange.

The color range of the casing is subject to change. The casing is suitable for printing. The number of print colors varies from 1 to 6. CMYK printing is optional.

Printing: the curved casings can be used only for:  
- single-side printing with 'face register';



- double-side printing without register (i.e. when the artwork is background printing).

The **AMILUX** permeable casing can be supplied in the optional (vacuum) packing. Plastic bags are used for this purpose.

The optional (vacuum) packing provides for the following benefits to the customer:

- 10-12 % greater length of casing in a standard box (e.g., the length of dia 22 casing in a standard packing, is 4500m, while the optional packing contains 6300m), which cuts the logistical costs of transportation and storage of the casing through optimization of the use;
- better production hygiene, since the casing can be brought from the store to the shop in its vacuum packing, without the shipping carton;
- lower waste disposal costs (because the quantity of used cartons will be several times less).

Special services can be ordered.

Shirring services:

- bespoke length of the stick or of the shirred casing;
- double closure of sticks (for type A sticks).

## 4. HOW TO USE THE CASING

### 4.1. Storage and transportation of the casing

4.1.1. The casing must be stored in the original packing in closed dry and clean rooms compliant with the sanitary-hygienic standards for the meat processing industry, at a distance of no less than 1m from any heaters, in the absence of strong-smelling or corrosive substances, at the temperature from +5 °C to +35 °C and the relative humidity not more than 80%.

4.1.2. The **AMILUX** casing must be transported at a temperature not exceeding +40 °C, and protected from exposure to direct sunlight.

4.1.3. If the casing was stored at a temperature below 5°C, hold it at room temperature for no less than 24 hours before opening the packing for processing.

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





## 4.2. Preparation of the casing for processing

Preparation of the **AMILUX** casing for processing consists in the following:

- bring the original packing to the shop from the store, put it on a dry surface (floor, table), then open the manufacturer's packing immediately before processing of the casing;
- the **AMILUX** casing does not require any pre-soaking before use, because the high elasticity of the casing is sufficient to easily attain the recommended stuffed caliber. This not only improves the production rate, but also ensures a high hygienic level of the production site;
- take the shirred casing sticks out of the packing in such a way as to preserve the integrity of shirring. In order to ensure integrity of the shirred stick after opening of the manufacturer's packing, avoid exposure of the casing to moisture before use;
- throughout the entire technological cycle of production, take care to avoid damage of the casing. Especially dangerous is contact with various burrs, uneven or rough surfaces, etc.

## 4.3. Forcemeat composition

When the **AMILUX** casing is used for production of frankfurters and wieners according to GOST R 52196-2003 and other regulatory documents (specifications), the quantity of moisture added to the emulsion must be the same as that in the case of cellulose casings.

When new recipes are developed according to the standard specifications (TU), the amount of the added water should be determined with regard to the moisture-retaining properties of the gelling agents used (such as carrageenans, plant proteins, animal proteins, etc.), and the relevant instructions on use must be followed to avoid formation of water and fat pockets.

## 4.4. Forming of products

Forming of the **AMILUX** casing starts with inspection of the equipment and of the work table.

Make sure there are no burrs on the equipment parts, or sharp objects, indentations, or rough places on the working surface of the table, in order to avoid damage to the casing.



Never prick (puncture) the casing of frankfurters and wieners. The casing will burst, if punctured.

Observe the direction of stuffing - the shirred sticks must be put onto the horn with the 'herring-bone' inward, i.e. with the 'herring-bone' apex toward the stuffer.

To avoid the 'zebra' effect on the product after smoking, strictly observe the following rules:

- never touch the shirred stick with wet hands (the hands must be dry!) when putting it into the storage hopper;
- always keep the storage hopper dry;
- prevent water drops falling on the shirred sticks when washing the emulsion remnants from the equipment;

Failure to observe these rules may cause dark spiral bands on the products after the thermal processing.

The rate of stuffing of the **AMILUX** casing on linkers should be selected with regard to the technical condition of the equipment.

During the forming of products, bear in mind that the packing label shows not the nominal caliber of the **AMILUX** casing, but the minimal stuffed caliber. The nominal caliber is not specified.

The ultimate stuffed caliber depends on many factors, such as the temperature, the emulsion consistency, and the condition of the stuffing equipment. The lower the emulsion temperature, the less is the stuffed caliber. Note also, that all process measures aimed at greater binding of water (greater yield) lead to greater internal pressure of the emulsion during the thermal processing. Emulsions with more meat substitutes will swell more. To preserve a significant water-binding capacity of the emulsion and avoid ruptures of the casing during the thermal processing, we recommend to use the minimum stuffed caliber (e.g., 25.0mm for nominal dia 24), and reduce the stuffing rate by 10-20%. In practice, the stuffed caliber for the **AMILUX** casing is determined on the production site, and may change depending on the type of product and equipment used.

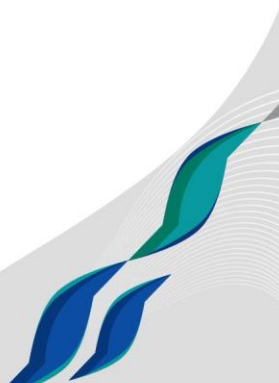




Table 3

Casing caliber, mm	Type	Recommended stuffed caliber, mm	Recommended horn diameter for		Recommended chuck number
			automatic equipment	linkers	
17	A, R	17.5 – 18.0	9	8 -9	17/18/19
18	A, R	18.5 – 19.5	9	8 -9	18/19
19	A, R	20.0 -21.5	9	8 -9	19/20
20	A, R	21.5- 22.0	10	10-11	20/21
21	A, R	22.5- 23.0	10	11-12	20/21/22
22	A, R	23.5- 24.0	11	11-12	21/22/23
23	A, R	24.5 – 25.0	11	11-12	22/23
24	A, R	25.0- 25.5	12	12-13.5	22/23/24
26	A, R	27.5-28.5	12	12-13.5	25/26
27	A, R	28.5 -29.5	12	12-13,5	25/26/27
28	A, R	29.5-30.0	12	12-13,5	26/27/28
29	A, R	30.5-31.5	14	14-16	29
32	A	33.0-33.5	17	14-16	29
32	R	35.0-35.5	-	14-16	29
34	A	35.0-35.5	17	14-16	29
34	R	37.5-38.0	-	14-16	29
38	R	40.5-41.0	-	16-18	29
22	Ako	24.0-24.5	11	11-12	21/22/23
22	Rko	24.0-25.0	11	11-12	21/22/23
24	Ako	25.5-26.0	12	12-13.5	22/23/24
24	Rko	26.0-26.5	12	12-13.5	22/23/24
32	Rko	35.0-36.0	-	16-18	29
34	Rko	38.0-39.0	-	16-18	29
38	Rko	41.0-42.0	-	16-18	29

The production rate and the overfilling ratio of the **AMILUX** casing on the frankfurter and wiener equipment should be selected with regard to the technical condition of the equipment. The required forming parameters are achieved by adjustment of the forming equipment in accordance with its technical characteristics.

Compliance with the recommended stuffed caliber ensures a good look of the finished products, increases the stuffing capacity, and reduces the risk of water and fat pockets and ruptures of the casing.



## 4.5. Thermal processing

Thermal processing of frankfurters and wieners in **AMILUX** casing is performed in fixed shaft chambers, or in universal heat chambers.

Manufacturers should choose their individual heat treatment conditions, because the capabilities of the equipment (fixed shaft chambers or universal heat chambers) are all-important in this process, while the desired result is achievement of a better crust or reduction of losses during the thermal processing.

We recommend the classical thermal processing scheme, which includes the stages of drying (color formation), smoking, and boiling. Drying should start at a temperature of 50-55 °C. As the drying progresses, the temperature is gradually raised to 65 °C. At this stage coagulation of the emulsion proteins is achieved, and the 'protein crust' is formed.

Next follows the stage of smoking at a temperature of 65-70 °C and air humidity of 40-60%. At this stage further consolidation of the crust occurs and the crust becomes colored by the smoke components. Then cooking is performed at the air humidity of 100% and temperature of 75-80 °C until the product is ready for consumption.

The cooking stage should be followed by an additional stage of drying during 10-15 minutes at the temperature of 65 °C to restore the crust damaged during the cooking stage.

The processes of drying and hot smoking significantly influence the quality of the finished product. By adjusting the temperature, moisture content and duration of these stages, the moisture losses, the crust thickness, the color and the taste of the product can be varied

Examples of thermal processing conditions for the **AMILUX** casing:

Example 1. Autotherm chamber with a steam smoke generator, Ø24

Table 4

Process stage	T, °C	RH, %	t, min
Preheating	55	50	15
Pre-drying	60	25	20
Wet smoking	65	70	15
Drying (airing)	65	25	5

Wet smoking	75	70	10
Cooking until ready for consumption	78	99	until ready
Total time			≈80

Differentiation of the taste of frankfurters and wieners using this method of smoking is achieved by increasing or decreasing the smoking time. The smoke generation temperature is maintained constant.

Example 2. Verinox heat chamber, a combination of convection and steam smoking, Ø32

Table 5

Process stage	Thermal processing mode	
Pre-drying	55 °C 20 min., humidity 30%	Exhaust damper open, exhaust ventilation on, fan speed high
Roasting	60 °C 15 min., humidity 50%	Fresh air inlet damper and exhaust damper open, exhaust ventilation on, fan speed high
Smoking	65 °C 25 min., humidity 70%	Exhaust damper open, fan off
Smoking	70 °C 10 min., humidity 80%	Exhaust damper open, fan off
Cooking	78 °C to 72 °C in chub core, humidity 99%	Smoke supply continues, exhaust damper open, exhaust fan speed high
Airing	3 min.	-
Moisture losses	6-8%	
Total time	≈ 90 min.	

These thermal processing conditions have been tried at several meat processing facilities. Such thermal processing conditions for frankfurters ensure a marked crust, the frankfurters remain juicy, and peel off easily.

## 4.6. Cooling

Upon completion of the thermal processing, the products in the **AMILUX** casing must be immediately cooled. Cooling can be carried out under running water or shower, or by means of time-delayed sprinklers, until the chub core temperature is down to 25 - 35 °C.



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

#### **4.7. Transportation and storage of products**

Transportation and storage of products made with the use of the **AMILUX** casing shall be in accordance with the relevant regulatory documents (GOST, Specifications).

### **5. MANUFACTURER'S GUARANTEES**

5.1. The Manufacturer guarantees conformity of the casing with the requirements of the Specifications subject to compliance with the required conditions of transportation and storage at the user's warehouse.

5.2. The shelf life of the casing is 2 years from the date of manufacture, subject to integrity of the manufacturer's packing.



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