



ATLANTIS-PAK

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Packaging Solutions



Casings

LST

Process Operating Manual



1. APPLICATION

The **LST** casing is a multilayer barrier casing made of polyamide, polyolefin and an adhesive permitted for use in the food industry by the Ministry of Health of the Russian Federation.

The **LST** casing is intended for production of all types of frankfurters, wieners, hot dogs, mini-sausages, spreads, liver sausages, and spreadable sausages.

The distinctive features of the LST casing are:

- ease of peeling (when peeled manually) immediately after the thermal processing or by the end consumer, with no need for the stage of spraying (cooling);
- no migration of the colorant from the product into the environment during the thermal processing or heating before consumption by the end consumer.

The **LST** casing is made according to the Specifications TU 2291-053-27147091-2013 from blends of high-quality synthetic and natural materials.

The **LST** casing is supplied under the declaration of conformity required by the Technical Regulations of the Customs Union TP TC 005/2011 On Packaging Safety.

2. PROPERTIES AND ADVANTAGES OF THE LST CASING

2.1. Specifications of the casing

2.1.1. The **LST** casing is made on advanced equipment, which provides for:

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

2.1.2. See Table 1 for the main quality characteristics and test conditions for the **LST** casing.

Table 1

Parameters	LST values	Unit measure	Test method	Test conditions
Thickness Mean value	20.0	µm		Schröder ball thickness gauge, T= (25±2) °C, humidity= (60±5) % RH
Temperature range	From – 40 °C to +100 °C	°C		
Water vapor transmission rate, not more	25.0	g/m ² * 24 hrs	Based on DIN 53122-74	At T= 30 °C, humidity= 90% RH
Tensile strength, not less MD TD	14.0 15.0	kgf/mm ²	GOST 14236-81 (ST SEV 1490-79)	Shimadzu AGS-H test machine, V=100mm/min, T=(25±2) °C, humidity=

				(60±5)% RH
Elongation at break, not more MD TD	210 170	%	GOST 14236-81 (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. High mechanical strength of the LST casing

makes it possible to form products not only by manual tying, but also on various types of high-capacity equipment, which provides for a high rate of production and overfilling relative to the nominal caliber. The nominal casing caliber means the supplied caliber.

Uniformity of the **LST** casing caliber provides for stable stuffing:

- on hot dog lines and stuffer linkers;
- on clipping equipment.

2.2.2. High barrier properties. Permeability of the **LST** casing to oxygen and water vapor is lower, by an order of magnitude, than that of collagen and cellulose casings, which ensures the following advantages:

- zero losses during the thermal processing and storage;
- retardation of the oxidative processes responsible for rancidification of fats and change in the natural colors of frankfurters and wieners;

2.2.3. High heat resistance of the polymers used for production of the **LST** casing significantly extends the processing temperature range of the casing in comparison with that for cellulose and collagen casings. The casing is resistant to high temperatures.

2.2.4. Microbiological resistance

The polymers in the formula of the **LST** casing are impervious to bacteria and mold fungi. This improves the hygienic characteristics of both the casing itself, and of the finished product.

3. ASSORTMENT OF PRODUCTS

Calibers supplied: 18 – 40mm;

LST / LST PL type A – closed end of the shirred stick, the casing is designed for use on automatic equipment;

LST / LST PL type R – open end of the shirred stick, the casing is designed for manual tying and use on stuffer linkers;
The **LST** casing is supplied shirred.

Table 2

Caliber, Mm	Casing type	Shirring type	Length of strand in stick, m
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	33.3 (34.0)
23	A/ R	tight	33.3 (34.0)
24	A/ R	tight	33.3 (40.0)
25	A/ R	tight	33.3 (34.0)
26	A/ R	tight	33.3 (34.0)
27	A/ R	tight	33.3 (34.0)
28	A/ R	tight	33.3 (34.0)
29	A/ R	tight	33.3 (34.0)
30	R	loose	50.0 (30.0)
31	R	loose	50.0 (30.0)
32	R	loose	50.0 (30.0)
33	R	loose	50.0 (30.0)
34	R	loose	50.0 (30.0)
35	R	loose	50.0 (30.0)
36	R	loose	50.0 (30.0)
37	R	loose	50.0 (30.0)
38	R	loose	50.0 (30.0)
39	R	loose	50.0 (30.0)
40	R	loose	50.0 (30.0)

LST casing colors: clear, smoke, light smoke, pink 4.

Customer-tailored orders are also accepted for:

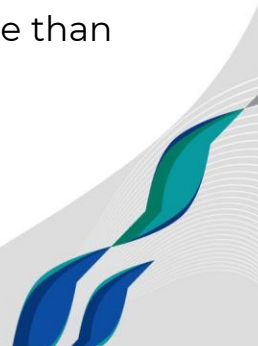
-shirring: bespoke length of the shirred stick or casing;

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 dry and clean rooms compliant with to the sanitary/hygienic standards for the meat processing industry, at a distance of no less than 800m from any heaters, in the absence of strong-smelling or corrosive substances, at the temperature from 5 °C to 35 °C and the air relative humidity not exceeding 80%.

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



4.1.3. If the **LST** casing was transported at a temperature below 0 °C, it must be kept at room temperature for no less than 24 hours before opening of the packing and processing.

4.1.4. Never drop the boxes containing the casing or subject them to impacts.

4.2. Preparation of the casing for processing

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

Bring the original packing to the production 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 **LST** casing used on frankfurter lines and stuffer linkers (calibers 18 -27mm) does not require any additional preparation before use.

When the casing is used on clipping equipment (calibers 28 - 40mm), the preparation process consists in pre-soaking in potable water (SanPiN 2.1.4.559-96 Potable Water. Hygienic Requirements for the Quality of Water in Centralized Potable Water Supply Systems. Quality Control.) at the temperature of 25-30 °C. The shirred sticks must be completely submerged in water, with the nets on. The soaking time is 15- 30 minutes.

Compliance with these requirements makes the casing highly elastic, which substantially facilitates the process of stuffing and ensures uniform filling.

4.3. Forcemeat composition

When frankfurters or wieners in the **LST** casing are made according to GOST R 52196-2003 or other standard specifications (TU), the quantity of moisture added to the emulsion should be reduced, on the average by 5-10% of the weight of the raw materials, compared with the recipes for natural, collagen, or viscose-reinforced 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

Start forming of products in the **LST** casing with inspection of the equipment and the work table.



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

Never prick (puncture) the casing of frankfurters, wieners or mini-sausages. The casing will burst, if punctured.

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

The rate of stuffing of the **LST** casing on linking or clipping equipment should be selected with regard to the technical condition of the equipment used.

When forming the products, bear in mind that the packing label shows the nominal caliber, that is the supplied caliber.

The ultimate caliber depends on many factors, such as the temperature, the meat texture, and the condition of the stuffing equipment. The lower is the meat temperature, the less is the stuffed caliber. In practice, the **LST** stuffed caliber will be determined on the production site, and may change depending on the product type and the equipment used.

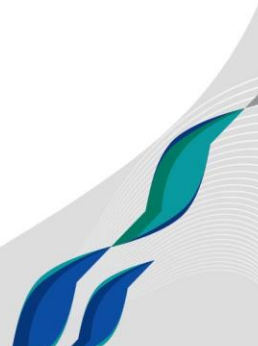
Table 3

Casing caliber, mm	Type	Recommended stuffed caliber, mm	Recommended horn diameter, mm
18	A, R	18.5 – 19.0	8
19	A, R	19.5 – 20.0	10
20	A, R	20.5 – 21.0	10
21	A, R	21,0 – 21.5	10
22	A, R	22.5 – 23.0	11-12 (13.5)
23	A, R	23.5 – 24.0	11-12 (13.5)
24	A, R	24.5 – 25.0	11-12 (13.5)
25	A, R	25.5 – 26.0	11-12 (13.5)
26	A, R	26.5 – 27.0	11-12 (13.5)
27	A, R	27.5 – 28.0	11-12 (13.5)

The production rate and the stuffing ratio for the **LST** casing used on frankfurter and wiener machines should be determined with regard to the technical condition of the equipment. The desired forming parameters should be achieved by adjustment of the forming equipment, with regard to the technical specifications for the equipment used.

To achieve a good look of the finished products and improve the meat holding capacity of the casing, the **LST** casing (calibers 30 - 40mm) should be overfilled by 12-15%.

4.5. Thermal processing



Thermal processing of products in the **LST** casing is performed in fixed shaft chambers or universal heat chambers, while cauldrons are used for boiling.

Manufacturers should choose their individual thermal processing conditions, because the capabilities of the equipment (fixed shaft chambers or universal heat chambers, boiling cauldrons) are all-important in this process.

Thermal processing of products in the **LST** casing consists in cooking, or cooking and cooling. The stages of pre-drying and roasting can be dispensed with during the technological process.

For the **LST** casing, it is recommended to use either staged cooking, or delta cooking (if the equipment is adequate for that). In either case, cooking should start at a temperature of no more than 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 stepped raising of the temperature in the heat chamber as the product core temperature is reaching the temperature of the heating medium. The first stages are heating at moderate temperatures (55, 65, 75 °C) to ensure a slow coagulation of the proteins and redistribution of the temperature throughout the product volume. The last stage is bringing of the product to consumption readiness (72 °C in the chub core).

The following sequence is an example of thermal processing of products in the **LST** casing, caliber 24:

- 55°C in a heat chamber at 100% humidity - 10 minutes;
- 65°C in a heat chamber at 100% humidity - 15 minutes;
- 75°C in a heat chamber at 100% humidity - 15 minutes;
- 80°C in a heat chamber at 100% humidity until the chub core reaches the temperature of 72 °C.

When boiling in cauldrons, it is recommended to:

- load the products in water at a temperature of 55-60°C to avoid uncontrolled shrinkage or deformation of the chubs;
- keep the products underwater and move them for uniform cooking;
- before loading of each new batch of products, reduce the temperature in the cauldron down to 60 °C.

4.6. Cooling

After completion of the process, products in the **LST** casing must be immediately cooled. Cooling is achieved by spraying.

Peeling of the **LST** casing off the product is performed manually, directly at the production site, or by the end consumer.



The **LST PL** casing is removed by means of peelers on the production site. The casing can be removed even on the date of manufacture, or during the next day. The recommended product core temperature is 10 – 12 °C. Do not expose the finished products to any air draughts (fast air flows) during storage, otherwise moisture will rapidly evaporate from the product surface, leaving wrinkles.

It is recommended to either re-spray or dip the products in cold water immediately before removal of the casing.

Peelers are supplied with replacements parts to accommodate different diameters of products. Follow the manufacturer's instructions to install the appropriate set of parts.

It is recommended to supply steam to the peeler's steam tube to facilitate removal of the casing.

Prior to introduction of a link of products into the peeler's steam tube, remove the knots at the link's ends to avoid their getting into the vacuum roller holes, which would result in winding of the casing on the vacuum roller.

Adjust the peeler's pressure rollers for the product diameter. The rollers must provide for engagement of the product so as to procure for free and stable (no slipping) travel of the link to the casing cut zone, without damaging the products.

The product link must freely pass through the steam tube without kinking or knotting.

Adjust the peeler's speed on a case-by-case basis, with regard to the length, diameter and shape of the products.

Adjust the blade so as provide for a stable cut of the casing at the minimum depth of the cut.

The peeler adjustment process must include adjustment of compressed air supply to open the casing after cutting. The compressed air flow should be sufficient for a stable opening of the cut casing, but should not damage the protein crust on the product.

4.7. Transportation and storage of products

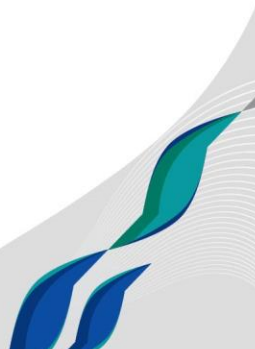
Transportation and storage of products made with the use of the **LST** casing shall be in accordance with the regulatory documents for the products (GOST, TU).

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 3 years from the date of manufacture, subject to integrity of the manufacturer's packing.





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