



ATLANTIS-PAK

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LST CASING

Process Operating Manual



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1. APPLICATION

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

The **LST** casing is designed 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, without the stage of spraying (cooling);
- no migration of the colorant from the product into the environment during the thermal processing or heating for consumption by the end consumer.

The **LST** casing is made from blends of high-quality synthetic and natural materials.

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	Value for LST	Unit measure	Test conditions
Thickness Mean value	20.0	μm	Schroeder thickness gauge with a ball measuring pad, 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	At T=30°C, humidity=65% RH
Tensile strength, not less			Shimadzu AGS-H test machine,

	MD	14.0	kgf/mm ²	V=100mm/min, T=(25±2)°C, humidity=(60±5)% RH
	TD	15.0		
Elongation at break, not more	MD	210	%	Shimadzu AGS - H test machine, V=100mm/min, T=(25±2)°C, humidity=(60±5)% RH
	TD	170		
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 mold products not only by manual tying, but also on various types of high-capacity equipment, which provides for a high rate of production and overstuffing relative to the nominal caliber. The nominal casing caliber coincides with the actual caliber.

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

- on hot dog lines and stuffers with twisting devices;
- 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:

- no losses during the thermal processing and storage;
- retardation of the oxidative processes leading to 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 temperature range of use of the casing in comparison with 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 inert to the action of bacteria and mold fungi. This improves the hygienic characteristics of both the casing itself, and of the finished product.

3. ASSORTMENT

Calibers supplied: 18 – 40mm;

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

LST, LST PL, LST type R – open end of the shirred stick, the casing is designed for manual tying and use on stuffers with twisting devices;
The **LST** casing is supplied shirred.

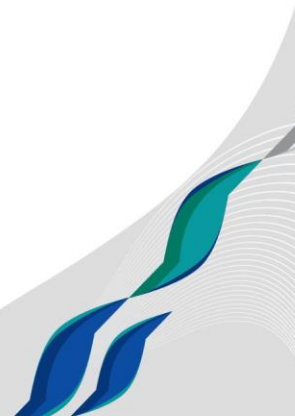
Table 2

Caliber, mm	Casing type	Shirring type	Length of strand in stick, m
18	A/ R	hard	25.0
19	A/ R	hard	25.0
20	A/ R	hard	25.0
21	A/ R	hard	25.0
22	A/ R	hard	33.3 (34.0)
23	A/ R	hard	33.3 (34.0)
24	A/ R	hard	33.3 (40.0)
25	A/ R	hard	33.3 (34.0)
26	A/ R	hard	33.3 (34.0)
27	R	soft	50.0 (30.0)
28	R	soft	50.0 (30.0)
29	R	soft	50.0 (30.0)
30	R	soft	50.0 (30.0)
31	R	soft	50.0 (30.0)
32	R	soft	50.0 (30.0)
33	R	soft	50.0 (30.0)
34	R	soft	50.0 (30.0)
35	R	soft	50.0 (30.0)
36	R	soft	50.0 (30.0)
37	R	soft	50.0 (30.0)
38	R	soft	50.0 (30.0)
39	R	soft	50.0 (30.0)
40	R	soft	50.0 (30.0)

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

Customer-tailored orders are also accepted:

-shirring service: bespoke length of the shirred stick or strand.



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 conforming to the sanitary/hygienic standards for the meat processing industry, at a distance of no less than 800 m from any heaters, in the absence of strong-smelling or corrosive substances, at a temperature from 5°C to 35°C and a relative humidity of the air of no more than 80%.

4.1.2. The **LST** casing must be transported at a temperature not exceeding +40°C, and protected from 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 use.

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

4.2. Preparation of the casing for use

The process of preparation of the **LST** casing for use 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 stuffers with twisting devices (calibers 18-27 mm) does not require any additional preparation before use.

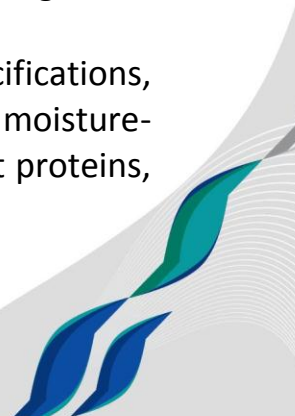
When the casing is used on clipping equipment (calibers 28 - 40mm), the preparation process consists in pre-soaking in potable water at a temperature of 25-30°C. The shirred sticks must be completely submerged in water, with the nets on. The soaking time is 15- 30 minutes.

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

4.3. Preparation of the emulsion

When frankfurters and wieners in the **LST** casing are made 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.

For the development of new recipes according to the standard specifications, 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. Molding of the products

Start molding 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 places on the working surface of the table, in order to avoid damages to the casing.

Never pierce the frankfurters, wieners or mini-sausages (puncture the casing). The casing will burst when 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 twisting or clipping equipment should be selected with regard to the technical condition of the equipment used.

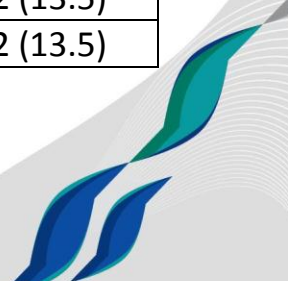
When molding of products, bear in mind that the packing shows the nominal caliber corresponding to the actual caliber.

The stuffed 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.

Recommended stuffed caliber

Table 3

Caliber of casing, 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 molding parameters should be achieved by adjustment of the molding equipment, according to the technical specifications for the equipment used.

To achieve a good appearance of the finished products and improve the meat holding capacity of the casing, the **LST** casing (calibers 30-40mm) should be overstuffed 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 boiling is performed in cauldrons.

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

Thermal processing of the products in the **LST** casing consists in cooking or cooking and cooling. The stages of pre-drying and roasting can be excluded from 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 pass through the coloring reactions. Higher starting temperatures may cause separation of the stuffing 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 72 °C in the chub core is

reached.

For boiling in cauldrons, it is recommended to:

- load the products into water at a temperature of 55-60°C to avoid uncontrolled shrinkage and deformation of the chubs;



- keep the products underwater and move for uniform cooking;
- before loading of each new batch of the products, reduce the temperature in the cooker down to 60°C.

4.6. Cooling

After completion of the process, the products in the **LST** casing must be immediately cooled. Cooling should be made with the stage of spraying.

The **LST** casing is removed off the product manually, by the meat processor directly or by the end consumer.

The **LST PL** casing is removed by means of peelers at the meat processing site. The casing can be removed either during the date of production, or during the next day. The recommended product core temperature should be 10-12 °C. Exclude any draughts (fast air flows) in the product storage rooms, otherwise the moisture will rapidly evaporate from the product surface, causing wrinkles on the product surface.

It is advisable to practice either repeat sprinkling or one-time dipping of products in cold water.

Peelers are supplied with replaceable sets for different diameters. Install the required set in accordance with the manufacturer's recommendations.

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.

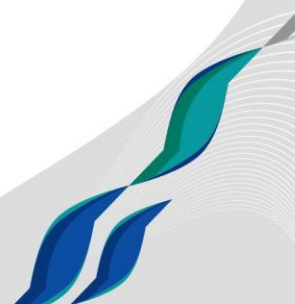
Adjust the peeler's pressure rollers for the product diameter. The rollers must provide for engagement of the product so as to procure for trouble-free and stable (no slipping) travel of the link to the casing cut zone, without damaging the products.

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.



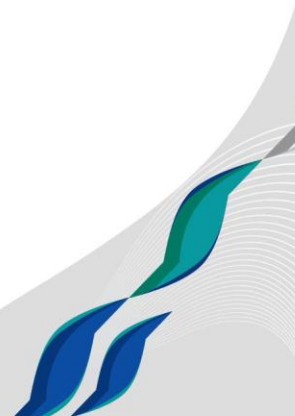
4.7. Transportation and storage of the products

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

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 manufacture, subject to integrity of the manufacturer's packing.



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