



ATLANTIS-PAK

Leader In Innovative
Packaging Solutions

Casings *iCel Premium* **iCel Premium**

Process Operating Manual



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1. APPLICATION

The casings of the **iCel Premium** line are designed for production, packaging, storage and sale of cooked, cooked-and-smoked, semi-smoked, raw-smoked and air-cured sausages subjected to smoking.

See Table 2 of this Manual for a detailed description of the types of **iCel Premium** casing.

The iCel Premium line of casings is made according to Specifications TU 22.21.29-049-27147091-2012 (equivalent to TU 2291-049-27147091-2012) from polyamide and pigments duly permitted for use in the food industry. The quality of the raw materials used to manufacture the casings is confirmed by Russian and international quality certificates.

The iCel Premium line of casings complies with the requirements of the Customs Union Technical Regulation on Packaging Safety (TP TC 005/2011), as confirmed by the duly issued and registered declarations of conformity.

The production, use, storage and transport of the casing are not harmful to the environment.

1.1. Recommended storage terms for the products packaged in iCel Premium casings

Table 1. Shelf life of products in iCel Premium casings

| Casing | Product | Regulatory document | Shelf life, days |
|--------------------------------|---------------------------------------|----------------------------|------------------|
| iCel | Moskovskaya cooked-and-smoked sausage | GOST R 55455-2013 | 15 |
| iCel | Muskatny cervelat | TU 9213-038-5158-5456-2014 | 15 |
| iCel packed in Amistyle film | Moskovskaya cooked-and-smoked sausage | GOST R 55455-2013 | 40 |
| iCel packed in Amivac MBL bags | Moskovskaya cooked-and-smoked sausage | GOST R 55455-2013 | 40 |
| iCel | Doktorskaya sausage | GOST R 52196-2011 | 10 |
| iCel | Braunschweiger sausage | GOST R 55455-2013 | 180 |

2. PRODUCT PROPERTIES AND ADVANTAGES

2.1. Advantages of the iCel Premium line of casings

2.1.1. The **smoke-permeable** casings of the **iCel Premium** line allow roasting and smoking, which imparts to the products the pleasant traditional taste and flavor of smoke, and contributes to the formation of the coagulated protein crust and glossy surface of the product under the casing.

2.1.2. The **high mechanical strength** of the **iCel Premium** casings makes it possible to use high-capacity automatic and semi-automatic clippers to ensure high production rates and shape consistency.

2.1.3. The **high elasticity** of the casings makes it possible to overfill the **iCel Premium** casing by up to 12%.

2.1.4. The **high oxygen barrier** properties compared with collagen and viscose-reinforced casings provide for the following advantages:

- reduction of oxidation processes, in particular, rancidification of fats;
- preservation of the individual flavor of spices in the finished products throughout the shelf life, regardless of whether secondary packaging is used.

2.1.5. The **high heat resistance** of the polymers used for production of the **iCel Premium** line of casings significantly extends the temperature range of utilization of this casing in comparison with cellulose casings. The casing is not only stable at high smoking temperatures (up to 75-85 °C), but also resistant to a prolonged effect of such temperatures.

2.1.6. **Microbiological resistance** is due to the use, for production of the **iCel Premium** casings, of polymers impervious to bacteria and mold fungi. This improves the hygienic characteristics of both the casing, and the finished products.

2.1.7. **Spiral peelability** facilitates removal of the casing off the product by the end consumer.

2.2. Basic characteristics of iCel Premium casings

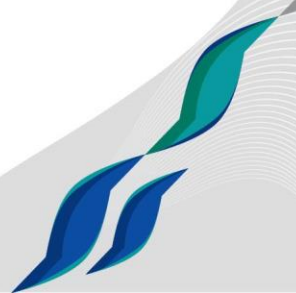
See Table 2 for the basic characteristics of **iCel Premium** casing by types.

Table 2. Assortment of iCel Premium casings *

| Casing description and type | Casing caliber, mm | Characteristics |
|-----------------------------|--------------------|---|
| iCel Premium | 30-120 | Glossy sausage casing with good permeability, used for stuffing of sausages |
| iCel Premium-Ko | 30-80 | Used to make curved sausage chubs; in other respects similar to iCel Premium |
| iCel Prestige | 40-120 | Glossy casing with greater permeability compared with iCel Premium, used for stuffing of cooked sausages subjected to smoking |
| iCel Premium Pro | 30-120 | Glossy casing with greater permeability compared with iCel Premium, used for stuffing of sausages |
| iCel Premium Pro Ko | 30-80 | Used to make curved sausage chubs; in other respects similar to iCel Premium Pro |
| iCel Premium- Lite ** | 30-120 | iCel Premium modification with reduced adhesion. Used for raw smoked sausages only |
| iCel Premium- Lite-Ko ** | 30-80 | Used to make curved sausage chubs; in other respects similar to iCel Premium-Lite. Used for raw smoked sausages only |

* iCel Premium casing is not suitable for removal by means of sausage peelers;

** iCel Premium-Lite casing will be offered to customers only if they are not satisfied with the adhesion of the standard iCel Premium or iCel C casings.



Colors of the **iCel Premium** casings: clear, smoke, light smoke, red, cherry, mahogany-1, mahogany.

The color range of the casing is subject to change.

The **iCel Premium** casings are suitable for single- or double-side printing. The number of print colors varies from 1 to 6.

The curved **iCel Premium** casings can be printed on the inner, the outer or the lateral part of the ring; the customer's order should specify the location of the print.

The **iCel Premium** products are supplied in the following forms:

- wound on cardboard cores (500m±2% or 1,000m±2% for straight casings, and from 100m to 1,000m±2% for curved casings);

- 'sticks' of shirred casing, each stick containing a string of 38m, 50m or 62m (25m or 31m for curved casings).

Optional services:

- printing: edge-to-edge printing;

- shirring: sticks with a loop under the rear clip; bespoke stick or casing length.

3. HOW TO USE THE CASING

3.1. Storage and transportation of casing

3.1.1. The casing must be stored in its original packing in closed dry and clean rooms conforming to the sanitary/hygienic standards for the relevant sector of the food industry, at a distance of no less than 800mm from any heaters, in the absence of strong-smelling or corrosive substances, at a temperature from 5 °C to 35 °C, and the air relative humidity not exceeding 80%.

3.1.2. It is recommended to protect the casing at storage and during transportation against exposure to direct sunlight or high temperatures.

3.1.3. It is recommended to open the manufacturer's packing just before processing of the casing.

3.1.4. If the casing was stored at a subzero temperature, then prior to use hold it in its original packing at room temperature during no less than 24 hours.

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

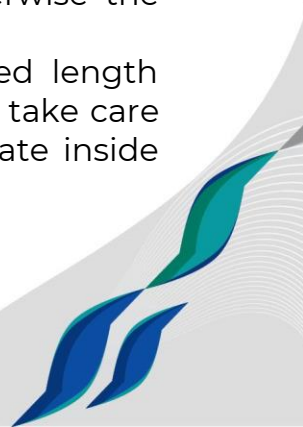
3.2. Preparation of the casing for processing

Preparation of the **iCel Premium** casings consists in the following:

Bring the casing in the permitted packaging from the store to the production room and put it on a dry surface (floor, table); open just before the processing.

Soak in potable water. Do not use hot water for soaking, otherwise the casing may shrink even at soaking.

Casing supplied in reels should be cut into sections of required length before soaking. When sticks of shirred **iCel Premium** casing are used, take care to keep the sticks completely underwater. Water must freely penetrate inside the sticks, driving out the air.



Pre-soak the casing for 1-3 minutes ***just before stuffing and forming***.

The water temperature should be 20-25 °C.

After pre-soaking, drain the residual water from the tube and put the casing over the stuffing horn.

The casing has a high elasticity, which substantially facilitates the process of stuffing and provides for uniform filling of the chub along its entire length.

3.3. Preparation of the forcemeat

When cooked sausages or hams, semi-smoked or cooked-and-smoked sausages are made with the use of the **iCel Premium** casings, the moisture content should be selected on a case-by-case basis.

When new recipes are developed according to the regulatory documentation (specifications), the quantity 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, milk proteins, etc.), and the relevant instructions on use must be followed to avoid formation of water and fat pockets.

3.4. Forming of sausages

Forming of the **iCel Premium** casings should start with inspection of the equipment and the work table.

To prevent any damage to the casing, make sure that there are no burrs on the equipment parts, or sharp objects, indentations, or rough areas on the working surface of the table.

Avoid any friction of the end parts of the reel against various uneven surfaces in the processing of the casing.

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

An important factor is the ratio between the stuffed caliber and the nominal caliber of the casing.

The **iCel Premium** casings should be stuffed at the following overfilling rate:

- at the forcemeat temperature below 0 °C: 5-7%,
- at the forcemeat temperature above 0 °C: 10-12%.

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

The curved **iCel Premium-Ko** and **iCel Premium-Lite-Ko** casings can be used on automatic or semi-automatic clippers. Such clippers must be equipped with a twine feeder and a special receiver tray for the sausage rings. The twine length between the sausage ends is adjusted on the twine feeder.

If no twine feeder is supplied with the equipment, this should not be an obstacle to the use of the curved casings. The twine can be fed manually. When manual clippers are used, the twine is fed into the clipper working zone from the side of the stick of shirred casing and clipped together with the casing. When the casing is put over the horn, it must be positioned in such a way as to prevent



the resulting rings twisting into the working parts of the clipper, and to guide them into the receiver tray.

The clip used must securely hold the ends of the chub, without damaging the casing (see Table 3).

Table 3. Recommended clip types

| Caliber | POLY-CLIP | | | TECHNOPACK | | COMPO | ALPINA |
|---------|---|---|--------------------------|--------------------------|-------------------|------------------|--|
| | Clip interval 15 interval 18 | R-ID | Clip series S | Clip series E | Clip series G | Clip series B | Clip interval 15 interval 18 |
| 30-65 | 15-7-4×1.25 15-7-5×1.5 15-7-5×1.75 18-7-5×1.5 18-7-5×1.75 | M08-175 M07-150 M07-200 L07-175 L08-200 | 524 528 625 628 | 210 410 | 175 370 | B1 BP1 | 15-7-5×1.5 15-7-5×1.75 18-7-5×1.5 18-7-5×1.75 |
| 66-90 | 15-8-5×1.5 18-7-5×1.5 18-7-5×1.75 | L07-150 L08-175 L08-200 L09-200 | 632 | 212 220 222 410 | 175 200 370 | B2 BP2 | 15-8-5×1.5 18-7-5×1.5 18-7-5×1.75 |

3.5. Thermal processing

Thermal processing of all types of semi-smoked and cooked-and-smoked sausages in **iCel Premium** casings produced with the use of technologies that involve smoking (smoke roasting) is performed in universal heat chambers.

The manufacturers should choose their individual thermal processing modes, because the equipment capacity is all-important in this process.

We recommend the classical thermal processing, which includes the stages of settling (4 -12 hrs), reddening (heating of the product), drying (color formation), smoking, and cooking.

Heating should start at a temperature of 50 - 55 °C. As the drying cycle progresses, the temperature is gradually raised to 60 - 65 °C. At this stage coagulation of the emulsion proteins occurs, and the 'protein crust' is formed.

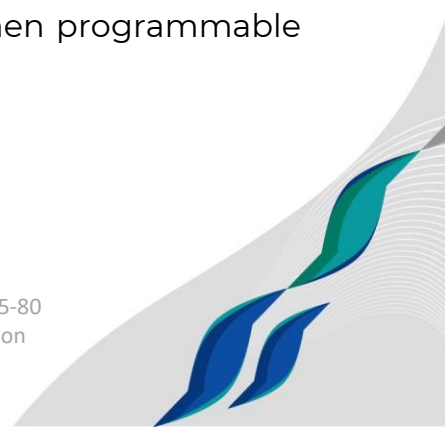
The next stage is smoking at a temperature of about 70 - 75 °C. At this stage the crust is consolidated and colored with the smoke components.

Then the product is cooked at the air humidity of 100% and temperature of 75 - 80 °C until ready for consumption.

After completion of the cooking process, it is recommended to carry out a short drying during 5-10 minutes at the temperature of 65 °C.

The process of drying and smoking significantly influences the quality of the finished product. By adjusting the temperature, the smoking moisture content, and the duration of these stages, the thermal processing weight losses, the crust thickness, the color and the taste of the product can be controlled.

The best thermal processing conditions are achieved when programmable units are used for drying, smoking, cooking and cooling.



3.6. Maturing of sausages

In the production of raw-smoked or air-cured sausages, the stuffed sausages are subjected to smoking and maturing in accordance with the technical documentation applicable to production of the particular product.

In the course of production of sausages of this type, heavy fractions of the process smoke may accumulate on the surface of the chubs. Thanks to the specific structure of the casing, they cannot penetrate it and remain on the surface. When condensate is formed on the chub surface, these substances react with moisture, which produces the so-called 'stickiness effect'. This effect disappears completely as the sausages continue to dry and mature.

This effect is partially due to retaining of polycyclic aromatic hydrocarbons (PAHs) on the surface of the iCel Premium casing. This phenomenon was described in detail in a study performed by the V.M. Gorbatov Research Institute for the Meat Processing Industry for comparative analysis of the quality of sausages packaged in different types of sausage casings (including comparison of the relative carcinogenicity of sausages in different casing types).

3.7. Cooling

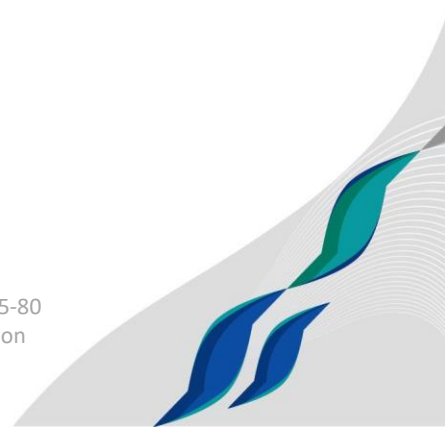
Upon completion of the thermal processing, the products in the **iCel Premium** casing must be immediately cooled. Cooling can be carried out under running water or shower, or by means of time-delayed sprayers, or in universal cooling chambers until the chub core temperature is down to 25 - 35 °C.

Cold air cooling is not allowed. Avoid any exposure of the finished products to air draughts until completely cooled, otherwise the surface may become wrinkled.

4. MANUFACTURER'S GUARANTEES

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

The guaranteed term of storage of the casing is 2 years from the date of manufacture, subject to integrity of the manufacturer's packing.



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