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Casings iCel

iCel

Process Operating Manual

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1. APPLICATION

The **iCel** casing is intended for the production, packaging, storage and sale of cooked sausages and hams, cooked-and-smoked, semi-smoked and raw-smoked sausages, wieners, hot dogs, mini-sausages and sausage-shaped processed cheeses.

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

The **iCel** casing 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** casing 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 human health or the environment.

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

Table 1. Shelf life of products in iCel 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 F 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 23670-2019	10
iCel	Braunschweiger sausage	GOST R 55455-2013	180

2. PRODUCT ADVANTAGES

2.1. Advantages of the casing

2.1.1. The **smoke-permeable iCel** casing allows 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** casing 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 casing makes it possible to overfill the **iCel** casing by up to 14% (all types, except for the iCel Sinuga Mko-U).

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** casing 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 is also resistant to a prolonged effect of such temperatures.

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

3. ASSORTMENT OF THE PRODUCTS

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

Table 2. Assortment of the iCel casings

Casing description and type	Casing caliber*, mm	Characteristics
iCel M	30-120	Matt casing with good permeability, used for making of sausages
iCel C	30-120	Glossy with good permeability for making of sausage chubs
iCel Sinuga Mko-U	65-80	Matt casing with good permeability for making of curved cooked sausages and hams, marked to imitate natural bung

* casings of bespoke calibers can also be supplied

The **iCel** casing is supplied with different degrees of adhesion for different food groups (the following casing versions are available):

- iCel C – Standard Adhesion.
- iCel M-U – High Adhesion.
- iCel C-CU – Super-High Adhesion.
- iCel Sinuga Mko-U – High Adhesion.
- The following casing versions are recommended for raw-smoked sausages: High Adhesion or Super-High Adhesion, depending on the sausage brand and type.
- The following casing versions are recommended for cooked sausages and hams: Standard Adhesion or High Adhesion.
- The following casing version is recommended for sliceware sausages subjected to peeling before slicing: Standard Adhesion.
- The following casing versions are recommended for semi-smoked and cooked-and-smoked sausages: High Adhesion or Super-High Adhesion.
- The following casing version is recommended for sausages stuffed with fatty batter: Super-High Adhesion.

Colors of the **iCel** casings: white, clear, claret, cherry, smoke, brown, red orange, salmon, mahogany, orange, light brown, dark brown, except for the iCel Sinuga Mko-U supplied clear only.

The color range of the casing is subject to change.

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

The curved **iCel** 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 Sinuga Mko-U** casing is marked with double-side multicolor printing with permeable inks to imitate the natural bung pattern.

The location of printing on the **iCel Sinuga Mko-U** casing is not specified.

Forms of supply of the **iCel** casings:

- reels on cardboard cores (500m±2% or 1000m±2% for straight casings, and from 100m to 1000m±2% for curved casings);
- 'sticks' of shirred casing, each stick containing a string of 38m, 50m or 62m (25m or 31m for curved casings).

Orders are also accepted for the following options:

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

4. HOW TO USE THE CASING

4.1. Storage and transportation of casing

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

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

4.1.3. Open the manufacturer's packing just before processing of the casing. If the integrity of the manufacturer's packing is compromised during storage, the casing must not be kept in storage, since this will result in drying-up and adhesion of the casing, and ruptures during the eventual processing. Such casing must be repacked.

4.1.4. 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.

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

4.2. Preparation of the casing for processing

Preparation of the **iCel** casing consists in the following:

Bring the casing in the suitable container 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 with the temperature of 20-25 °C. Do not use hot water for soaking, otherwise the casing may shrink prematurely at the stage of soaking.

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

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

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.

4.3. Preparation of the forcemeat

When cooked sausages or hams, semi-smoked or cooked-and-smoked sausages are made with the use of the **iCel** 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.

4.4. Forming of sausages

Forming of products in the **iCel** 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** casings should be stuffed at the following overfilling rates:

- when the forcemeat temperature is below 0 ^{o}C: 5-7%,
- when the forcemeat temperature is above 0 ^{o}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 recommended overfilling rate for the **iCel Sinuga Mko-U** casing is 35-45%. Compliance with the recommended sausage caliber ensures a good appearance of the finished products, increases the stuffing capacity and reduces the risk of water and fat pockets.

Products in the **iCel Sinuga Mko-U** casing will look more "natural", if the casing or products are dyed with a natural colorant, such as Annato or Annato + caramel, etc.

When sausages are tied manually, pay special attention to the quality of the twine; if there are hard inclusions, soak the twine to make it softer so as not to damage the casing. When using the **iCel Sinuga Mko-U** casing, it is recommended to tie the sausage in a pattern similar to that of the products in natural bung, that is, making loops at certain intervals.

The curved **iCel Sinuga Mko-U** casings can be used on automatic or semi-automatic clippers. Such clippers must be equipped with twine feeders and special receiver trays 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

4.5. Thermal processing

Thermal processing of all types of semi-smoked and cooked-and-smoked sausages in **iCel** 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 the 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 the 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.

4.6. Cooling

Upon completion of the thermal processing, the products in the **iCel** 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.

5. 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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