ATLANTIS-PAK

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Packaging Solutions

# Casings iColl

# iColl

## Process Operating Manual

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## 1. APPLICATION

**iColl** is a matt plastic casing permeable to process smoke, and is designed for the production of all types of frankfurters, wieners, hot dogs and mini-sausages made according to the traditional technology, including smoking and smoke-roasting, which offers products with the traditional sensory characteristics typical of products packaged in collagen or natural casings.

The **iColl** casing is intended for production and subsequent storage of the finished products inside the casing (in links). Secondary packaging is recommended to extend the shelf life of the sensory characteristics of the product.

The **iColl** casing is made according to an original proprietary technology in conformity with Specifications TU 22.21.29-066-27147091-2023 from mixtures of high quality materials developed by leading manufacturers of polymers. The quality of the raw materials used for the manufacture of the casing is confirmed by Russian and international quality certificates.

The **iColl** casing is covered by a declaration of conformity issued in accordance with the requirements of the Technical Regulation of the Customs Union TP TC 005/2011 on Packaging Safety.

## 2. PROPERTIES AND ADVANTAGES OF THE ICOLL CASING

### 2.1. Technical characteristics of the casing

2.1.1. The **iColl** casing is manufactured on advanced equipment, which provides for:

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

2.1.2. The basic quality parameters and the test conditions for the **iColl** casing are set out in the above Specifications.

### 2.2. Advantages of the casing

2.2.1. Optimal adhesion of the **iColl** casing to various types of stuffing provides for easy peeling of the casing off the finished product in spiral by

the end consumer (A, R); in addition, the finished packaged products can be stored inside the casing (in links).

2.2.2. High permeability of the casing to process smoke and water vapor allows roasting and smoking of the product, which imparts to the products the traditional smoked taste and flavor. This makes it possible to obtain sausages with the traditional sensory characteristics typical of the products in collagen or natural casings. The casing facilitates the formation of a dense coagulated collagen crust with a matt surface of the product under the casing. This contributes to stability of the process of peeling of the casing off the finished product by the end user without damaging the surface layer of coagulated protein (the crust).

2.2.3. Extended assortment of products.

The **iColl** casing is supplied straight or curved, which allows a wider assortment of products differing in their appearance. The curved versions of the **iColl** casing (type **Ako**, type **Rko**) make it possible to produce sausages in the form of half-rings without the use of expensive natural or collagen casings.

2.2.4. High heat resistance of the polymers used to make the **iColl** casing significantly extends the processing temperature range of the casing in comparison with collagen casings. The casing is stable at high temperatures.

2.2.5. High mechanical strength of the **iColl** casing permits forming of products using different types of equipment, and ensures high rates of production and possibility of overfilling relative to the nominal caliber. Caliber consistency of the casing provides for uniform stuffing on the modern high-capacity hot-dog lines and linker stuffers.

2.2.6. Microbiological resistance.

The materials used for production of the **iColl** casing are inert to the action of bacteria and mold fungi. This improves the hygienic characteristics of both the casing itself, and the finished products.

2.2.7. Optimal oxygen and water vapor transmission rates compared with collagen casings at the finished product storage temperature of (+2...+6 °C) offer the following advantages:

- reduced rate of oxidation processes in the finished products;
- preservation of the individual flavor of spices in the finished products throughout the shelf life;
- reduced weight losses (≈ 2 – 5%) during storage ( we recommend to store the products in a MAP or vacuum packaging);

- retarded process of syneresis (liquid separation) in the finished product inside a vacuum package (≈ 1.5 – 2 times).

## 3. ASSORTMENT OF PRODUCTS

**iColl** type A - closed end of the shirred stick; the casing is intended for use on automatic equipment.

**iColl** type R - open end of the shirred stick; the casing is intended for use on linker stuffers.

**iColl** type Ako - curved casing with a closed end of the shirred stick; intended for use on automatic equipment.

**iColl** type Rko - curved casing with an open end of the shirred stick; intended for use on linker stuffers.

The **iColl** casing is supplied shirred. The casing parameters are shown in Table 1 below.

Table 1

| Casing caliber, mm | Stick type | Shirring type | Length of strand in stick, m (±2%) |
|---|---|---|---|
| 19 | A/ R | tight | 20.0 |
| 20 | A/ R | tight | 20.0 |
| 21 | A/ R | tight | 20.0 |
| 22 | A/ R | tight | 20.0 |
| 22 | Ako/Rko | tight | 20.0 |
| 23 | A/ R | tight | 20.0 |
| 24 | A/ R | tight | 25.0 |
| 24 | Ako/Rko | tight | 20.0 |
| 25 | A/ R | tight | 25.0 |
| 26 | A/ R | tight | 25.0 |
| 26 | Ako/Rko | tight | 20.0 |
| 27 | A/ R | tight | 25.0 |
| 28 | A/ R | tight | 25.0 |
| 28 | Ako/Rko | tight | 20.0 |
| 29 | A/ R | tight | 25.0 |
| 30 | A/ R | tight | 25.0 |
| 30 | Ako/Rko | tight | 20.0 |
| 31 | A/ R | tight | 25.0 |
| 32 | A/ R | tight | 25.0 |
| 34 | R | loose | 31.0 |
| 36 | R | loose | 31.0 |

**iColl** casing colors: see the Catalogue of Colors.

The color range of the casing is subject to change.

The **iColl** casing can be used for single- or double-sided printing.

The number of print colors varies from 1+0 to 6 + 6.

The curved versions can be used only for:

- single-side printing with face positioning;
- double-side printing without positioning, i.e. when the artwork is background printing.

The **iColl** casing is supplied shirred and vacuum packed in accordance with the requirements of international standards. This provides for:

- the best preservation of the casing properties;
- integrity during transportation;
- impeccable sanitary/hygienic condition of the product throughout the process of transportation to the production area (without the carton) and storage of the casing;
- reduction of the costs of waste disposal (no used cartons).

## 4. HOW TO USE THE CASING

### 4.1. Storage and transportation of casing

4.1.1. The casing must be stored in the 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 not 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 air relative humidity of not more than 80%.

4.1.2. The **iColl** casing must be transported at a temperature not exceeding +40 °C, and protected against direct sunlight.

4.1.3. If the casing was stored at a temperature lower than 5 °C, hold it at the room temperature for not less than 24 hours before opening the packing and processing.

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

## 4.2. Preparation of the casing for processing

The procedure for preparation of the **iColl** casing for stuffing consists in the following:

- bring the original packing to the processing room from the store,

put it on a dry surface (table), then open the packing just before processing of the casing;

- the **iColl** casing does not require pre-soaking before use, because the high elasticity of the casing easily provides for the recommended stuffing gauge. This not only improves the throughput, but also ensures a high hygienic level of production;

- take the shirred casing sticks out of the box with care to preserve the integrity of the sticks.

In order to preserve the integrity of the shirred sticks, protect the casing from moisture before its use, after the manufacture's packing has been opened.

Throughout the technological cycle of production, take care to avoid damage of the casing. Especially harmful is contact with various burrs, uneven or rough surfaces, etc.

## 4.3 Preparation of the emulsion

For production of frankfurters and wieners in the **iColl** casing according to GOST R 23670-2019 and other regulatory documents (specifications), the quantity of moisture added to the emulsion must be the same as in the case of collagen casings.

In the development of new recipes according to the regulatory documentation (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 or animal proteins, etc.), and the relevant instructions on use must be followed to avoid formation of water and fat pockets.

## 4.4 Forming of the products

Forming of the products in the **iColl** casing starts with inspection of the equipment and of the work table.

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

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

Observe the direction of stuffing on stuffer linkers - 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.

Bear in mind that the packing shows the minimum stuffed gauge. The nominal caliber is not specified.

To avoid the zebra effect after smoking, strictly observe the following processing rules:

- do not touch the (tightly) shirred sticks with wet hands (keep your hands dry) when the sticks are loaded into the bin;
- keep the bin dry.

Failure to comply with these rules may cause the appearance of dark spiraling stripes on the product after thermal processing.

Table 2 below shows the recommended stuffed calibers of the casing. It should be borne in mind that the actual caliber and the forming rate for both stuffing options may vary depending not only on the technical condition of the forming equipment, but also on the emulsion temperature and consistency. The lower the emulsion temperature, the less are the stuffing caliber and the forming rate.

When maximum overfilling of the **iColl** casing is used, it should be remembered that emulsions containing a higher percentage of meat substitutes swell more during thermal processing, which builds up pressure inside the products. To avoid rupture of the casing during thermal processing, it is recommended to use the minimum recommended stuffed gauge (e.g., 22.0mm for dia 20.0mm casing).

Table 2

| Casing caliber, mm | Stick type | Recommended stuffed gauge | Horn diameter | | | Recommended chuck size |
|---|---|---|---|---|---|---|
| | | | Townsend | | Handtmann AL / Vemag | |
| | | | Horn size | mm | mm | |
| 19 | A/R | 21.0 - 21.5 | 11-12 | 8.7-9.5 | 9-10 | 17/18/19 |
| 20 | A/R | 22.0 - 22.5 | 12-13 | 9.5-10.3 | 10-11 | 18/19/20 |
| 21 | A/R | 23.0 - 23.5 | 12-13 | 9.5-10.3 | 10-11 | 19/20/21 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 22 | A/R | 24.0 - 24.5 | 13-14 | 10.3-11.1 | 11-12 | 20/21/22 |
| 22Ko | A/R | 24.5 - 25.0 | 13-14 | 10.3-11.1 | 11-12 | 20/21/22 |
| 23 | A/R | 25.0 - 25.5 | 14-15 | 11.1-11.9 | 11-12 | 21/22/23 |
| 24 | A/R | 26.0 - 26.5 | 14-15-16 | 11.1-11.9-12.7 | 12-13 | 22/23/24 |
| 24Ko | A/R | 26.5 - 27.0 | 14-15-16 | 11.1-11.9-12.7 | 12-13 | 22/23/24 |
| 25 | A/R | 27.0 - 27.5 | 14-15-16 | 11.1-11.9-12.7 | 12-13 | 23/24/25 |
| 26 | A/R | 28.0 - 28.5 | 14-15-16 | 11.9-12, 7-13.5 | 12-13 | 24/25/26 |
| 26Ko | A/R | 29.0 - 29.5 | 14-15-16 | 11.9-12, 7-13.5 | 12-13 | 24/25/26 |
| 27 | A/R | 29.0 - 29.5 | 14-15-16 | 12, 7-13.5-14.3 | 13-14 | 25/26/27 |
| 28 | A/R | 30.0 - 30.5 | 14-15-16 | 12, 7-13.5-14.3 | 13-14 | 26/27/28 |
| 28Ko | A/R | 31.0 - 31.5 | 14-15-16 | 12, 7-13.5-14.3 | 13-14 | 26/27/28 |
| 29 | A/R | 31.0 - 31.5 | 14-15-16 | 12, 7-13.5-14.3 | 13-14 | 29 |
| 30 | A/R | 32.0 - 32.5 | 18-19-20 | 14.3-15.8 | 14-17 | 29 |
| 30Ko | A/R | 33.5 – 34.0 | 18-19-20 | 14.3-15.8 | 14-17 | 29 |
| 31 | A/R | 33.0 - 33.5 | 18-19-20 | 14.3-15.8 | 14-17 | 29 |
| 32 | A/R | 34.0 - 34.5 | 18-19-20 | 14.3-15.8 | 14-17 | 29 |
| 32Ko | A | 35.0 - 35.5 | - | 14.3-15.8 | 14-17 | 29 |
| 34 | R | 36.5 - 37.0 | 20 | 14.3-15.8 | 14-17 | 29 |
| 36 | R | 38.5 - 39.0 | - | 14.3-15.8 | 14-17 | 29 |

The production rate and the percentage of filling of the **iColl** casing on the hot-dog equipment should be selected with regard to the technical condition of the equipment. The desired forming parameters should be achieved by adjustment of the forming equipment, in accordance with the specifications of the relevant machine.

Compliance with the recommended stuffed gauge reduces the risk of water and fat pockets and casing ruptures at the forming and thermal processing stages, and ensures a good selling appearance of the finished products.

## 4.5. Thermal processing

The **iColl** casing is intended for products made according to the traditional technologies that involve smoking (smoke roasting) to obtain food with traditional sensory characteristics typical of products in collagen or natural casings.

Manufacturers should select their specific thermal processing conditions, because the capacity of the equipment (smoke generator or atomization system) is all-important in this process, while the desired

result is achievement of a more marked and dense crust, and reduction of thermal processing losses.

The recommended thermal processing is the classic scheme including the stages of drying (color formation), roasting, smoking and boiling.

To achieve the desired properties, the products should be thermally processed with a smooth increase of the temperature.

Drying should start at the temperature of 50-55 °C, depending on the emulsion temperature. 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' proper is formed.

The **iColl** casing makes it possible to roast and smoke at higher temperatures, which allows for a much greater range of thermal processing modes and optimization of thermal processing.

The recommended next stage is smoking at the 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. Smoking may be performed in two stages, with an intermediate stage of drying or roasting, for further consolidation of the crust and color formation. The following stage is cooking at the air humidity of 100% and the temperature of 75-80 °C until the product is ready for consumption.

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

There are three main methods of smoking in universal heat chambers

- air/smoke mixture (smoldering of wood chips or sawdust by means of a heating element or friction of a rotary tool against a wooden bar);
- steam smoking (steam is heated to the required temperature and passed through sawdust);
- atomization method (spraying of an air/smoke mixture).

Examples of thermal processing modes for hot dogs.

Example 1 (see Table 3 below).

Heat chamber: Maunting. Stuffed product diameter: 24mm.

Table 3

| Process stage | Temperature, °C. | Time, minutes. | Humidity, preset, RH%. | Circulation rate |
|---|---|---|---|---|
| Color formation | 55 | 8 | 60 | 1 |
| Drying | 60 | 10 | 20 | 2 |
| Drying | 65 | 8 | 20 | 2 |
| Ignition | 70 | 5 | 0 | 1 |
| Smoking | 75 | 15 | 30 | 1 |
| Drying | 75 | 3 | 20 | 2 |
| Smoking | 75 | 10 | 30 | 1 |
| Airing | 65 | 5 | 0 | 2 |
| Cooking | 78 | to 72°C in core | 99 | 1 |
| Airing | 65 | 5 | 35 | 2 |
| Total time | | ≈ 84 minutes | | |

Adjustment of the time, humidity and temperature at the stages of smoking ensures the desired intensity of the smoked product flavor and taste. Smoking at the minimum humidity requires no additional stages of drying or roasting after the cooking process.

Example 2 (see Table 4 below).

Heat chamber: Autothehrm. Steam smoke generator. Stuffed product diameter: 24mm.

Table 4

| Process stage | T °C | Time, minutes. | Humidity, preset, RH%. | Humidity, actual RH%. |
|---|---|---|---|---|
| Heating | 55 | 15 | 50 | 50 |
| Drying | 60 | 10 | 20 | 30 |
| Drying | 65 | 15 | 20 | 20 |
| Smoking | 75 | 10 | - | 80-85 |
| Cooking | 80 | to 72°C in core | 100 | 100 |
| Total time | - | ≈ 75 minutes. | - | - |

These thermal processing modes have been tried at several meat processing facilities. Such thermal processing modes for hot dogs ensure a marked glossy crust with a smoked flavor and taste.

### 4.6. Cooling

Upon completion of thermal processing, the products must be immediately cooled. Cold air cooling is not recommended, because it may lead to appearance of wrinkles on the surface of the product. Cooling should be performed under running water, preferably under a spraying shower to increase the cooling area, until the product core temperature is down to 25-35 °C. After that the products must be moved into a cold store.

Exclude any exposure of the finished products to air drafts (fast-moving air flows) during the storage, because this leads to accelerated evaporation of moisture from the surface of the product and may cause surface wrinkles.

### 4.7. Transportation and storage of products

Transportation and storage of meat products manufactured with the use of the **iColl** casing must be in accordance with the applicable regulatory documentation (GOST, TU).

## 5. MANUFACTURER'S GUARANTEES

5.1. The Manufacturer guarantees conformity of the **iColl** 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 guaranteed term of storage of the casing is 2 years from manufacture, subject to integrity of the manufacturer's packing.

## 6. APPENDICES

There are no appendices to the present document.

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