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Casings **dyplex**

DYPLEX-Mini T

Process Operating Manual



1. APPLICATION

This Process Operating Manual describes the manufacturing process for hot dogs with the use of the DYPLEX-Mini T casing.

DYPLEX-Mini T casing (DYPLEX-Mini T) is a glossy casing with a light pearly shade intended for production, storage and sale of all types of frankfurters made by technologies that include the stage of smoking (smoke roasting). This casing allows the making of products with traditional sensory characteristics typical of the products in cellulose casings, and with an extended shelf life.

The DYPLEX-Mini T casing is made according to an original proprietary technology in conformity with Specifications TU 22.21.29-054-27147091-2013 from a mixture 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 distinguishing feature of the DYPLEX-Mini T casing is a combination of permeability properties, which allows the making of products with the smoked taste and flavor, and an extended shelf life.

The DYPLEX-Mini T casing complies with the requirements of the Technical Regulation of the Customs Union 005/2011 (Safety of Packaging) as confirmed by duly approved and registered declarations of conformity.

The production, use, storage and transportation of the casing pose no hazard for the environment or human health.

2. CONSUMER PROPERTIES AND ADVANTAGES

2.1. Advantages of the DYPLEX-Mini T casing

2.1.1. High permeability to gases and water vapor at the temperature of thermal processing of hot dogs (65-75 °C) allows the making of products with traditional sensory characteristics.

2.1.2. High mechanical strength of the DYPLEX-Mini T casing permits the forming of products with the use of high-capacity equipment at high forming rates.

2.1.3. Low oxygen and water vapor transmission rates at the product storage temperature of 0-6 C provide for:

- zero losses during the storage of hot dog products;
- microbiological stability of the products during the storage;
- retardation of the oxidation processes that cause rancidification of fats and changes in the natural color of the meat product;



- marketable appearance of the finished products throughout the shelf life.

2.1.4. The materials used for production of the DYPLEX-Mini T casing are impervious to the action of bacteria and mold fungi. This improves the hygienic characteristics of both the casing itself, and the finished products.

2.2. Basic characteristics of the DYPLEX-Mini T casing

Table 1 – Assortment of the DYPLEX-Mini T casings

	Type	Casing diameter	Shirring type	Length of shirred stick, mm	Casing strand length in shirred stick, m
DYPLEX-Mini T	Type R	21 - 23	tight, open end	240 - 245	25
DYPLEX-Mini T	Type A		tight, closed end		25
DYPLEX-Mini T	Type R	24	tight, open end		33.3
DYPLEX-Mini T	Type A		tight, closed end		33.3

DYPLEX-Mini T casing colors: see the catalogue of colors.

The color range of the casing is subject to change.

The DYPLEX-Mini T casing is suitable for single- or double-side printing. The number of print colors varies from 1+0 to 6+6.

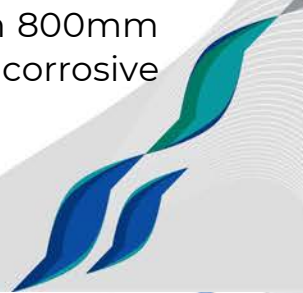
The DYPLEX-Mini T casing is supplied shirred and vacuum packed in accordance with the requirements of international standards. This provides for:

- 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).

3. HOW TO USE THE CASING

3.1. Storage and transportation of the casing

3.1.1. 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 800mm 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 not more than 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. Open the manufacturer's packing just before processing of the casing.

3.1.4. If the casing was stored at a temperature below +5° C, 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

The DYPLEX-Mini T casing intended for automatic hot dog lines does not require any additional preparation (pre-soaking) before the stuffing.

When the DYPLEX-Mini T casing is used on semiautomatic hot dog lines, it may be processed with or without pre-soaking, depending on the desired stuffed caliber, and on the equipment capacity.

When the DYPLEX-Mini T casing is used on linker stuffers, it requires pre-soaking.

Soak the casing in potable water at the temperature of 20 - 25 °C during 10 - 15 minutes.

Do not soak the casing in hot water, because the casing will heat-shrink prematurely.

3.3. Preparation of the forcemeat

The forcemeat for production of frankfurters or wieners in the DYPLEX-Mini T casing shall be prepared in accordance with the relevant regulatory documentation for such products.

It should be borne in mind that during the thermal processing the forcemeat inside the DYPLEX-Mini T casing loses from ≈ 0.5 to 3 % of moisture, therefore the calculation of the amount of water added to the stuffing at the stage of cutting shall be made on the basis of the moisture resistance of the casing and the moisture-retaining properties of the additives used.

All technological measures aimed at increased binding of water (raising of the yield) lead to a growth of the pressure in the forcemeat during the thermal processing. Forcemeats with an elevated percentage of meat substitutes tend to swell more. In order to preserve the forcemeat's capacity of binding significant amounts of water and to prevent bursting of the casing during the thermal processing, it is



recommended to introduce all water-binding additives into the cutter not in a dry form, but in the form of jellies or emulsions.

3.4. Forming of sausage products

Forming of the DYPLEX-Mini T casing starts 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.

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 caliber. 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.

Table 2 – Recommended stuffed calibers of the DYPLEX-Mini T casing

Casing caliber, mm	Recommended stuffed caliber, mm	Townsend automatic lines		Handtmann or Vemag automatic lines, horn diameter mm
		Horn number	Horn diameter, mm	
21	22 – 22.5	13/14	10.3/11.1	10 - 11
22	23 – 23.5	14/15/16	11.1/11.9/12.7	11 - 12
23	24 – 24.5	14/15/16	11.1/11.9/12.7	11 - 12
24	25 – 25.5	14/15/16	11.1/11.9/12.7	11 - 12

3.5. Thermal processing

Thermal processing of the product in the DYPLEX-Mini T casing can be carried out in heat chambers of different types.

Each processor should select its thermal processing mode with regard to the equipment capacity and the desired thermal processing result. By adjustment of the temperature, humidity and duration of the thermal processing stages, the moisture loss, the product color and taste, and the 'protein' crust strength can be controlled.

We recommended to proceed with the thermal processing using the classic sequence: drying (color formation), smoking, then cooking.

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

The next stage is smoking at the temperature of about 70 - 75 °C and the air humidity of 40-60 %. At this stage the crust is consolidated and colored with the smoke components.

Then the product is cooked at the air humidity of 98% and temperature of 78 - 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.

Below is an exemplary thermal processing mode for products in the DYPLEX-Mini T casing, caliber 24.

Table 3 – Thermal processing mode for Maunting heat chambers

Process stage	T °C	Time, minutes	Preset humidity, RH %	Circulation rate
Heating	50	15	55	1
Drying	60	15	35	2
Drying	65	10	25	2
Ignition	70	5	60	1
Smoking	70	15	45	1
Smoking	75	20	35	1
Cooking	80	To 72 °C in chub core	98	1
Drying	65	5	25	5
Total time		≈ 90 minutes		

3.6. Cooling

Upon completion of the thermal processing, the products in the DYPLEX-Mini T casing must be immediately cooled. Cooling can be carried out under running water or shower, or by means of spraying using timing

devices, until the chub core temperature is down to 25 – 32 °C, or in universal cooling chambers.

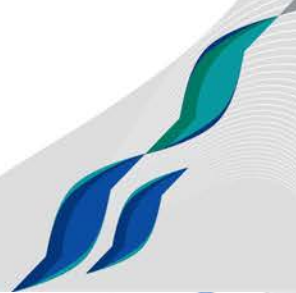
Never use cold air cooling.

Exclude any exposure of the finished products to air drafts during the storage, because this leads to accelerated evaporation of moisture from the product and may cause wrinkles on the surface.

3.7. 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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