ПЕНТОПАК
ТОВ "ПЕНТОПАК УКРАЇНА"

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Instructions for Use
Pentaflex-Shape® Multilayer Heat-Shrink Synthetic Casing for packaging of meat products

Purpose

Pentaflex-Shape® casing is manufactured in accordance with TU U 25.2-20620489-006-2003 and is intended for packaging of cooked sausages and hams produced in loaves, including products formed in press molds of various configurations and/or in combination with netting.

Advantages

Compared to viscose-reinforced, natural, and protein casings, Pentaflex-Shape® offers:
biological inertness;
high barrier properties;
high mechanical strength;
elasticity;
low oxygen and water vapor permeability;
operating temperature range of products in casing from –30°C to +115°C;
no losses during thermal processing;
extended shelf life of products (up to 60 days, provided storage at +0°C to +6°C).

Storage at the Manufacturing Facility

The casings must be stored in the manufacturer's original packaging in clean, dry warehouse premises, free from foreign odors and aggressive substances, protected from direct sunlight, at least 1 meter away from heating devices, at a room temperature not exceeding +25°C and relative humidity not exceeding 80%.

The casing must remain in the manufacturer's packaging until use to prevent premature moisture absorption inside the roll. Failure to comply may result in sticking of the casing in the roll.

The guaranteed shelf life of the casing is 36 months.

Dropping cartons with casing or subjecting them to impacts is strictly prohibited.

The casing is frost-resistant and withstands temperatures down to –30°C. Mechanical abrasion must be avoided.

If the casing was stored at temperatures below 0°C, it must be conditioned at room temperature for at least 24 hours before opening the packaging.

Preparation of the Casing for Use

During preparation (unwinding the roll, cutting into lengths), friction between the roll ends and the casing surface against uneven objects must be avoided. It is recommended to unwind the casing with the roll **positioned vertically.**

Before use, Pentaflex-Shape® casing must be cut into sections of the required length and soaked in water at +18°C to +25°C for 30 minutes. **During winter, water at +25°C may be used to accelerate soaking.**

Cutting of the casing prior to use must be carried out outside the production area, as high humidity may cause sticking in the roll and ruptures during unwinding and stuffing.

After cutting, remaining casing on rolls must be stored in the original factory packaging (in a polyethylene bag). Soaking the casing in hot water is strictly prohibited.

To ensure uniform soaking, it is recommended to open one end of the casing segment and flush water through the sleeve so that wetting also occurs on the inner surface. This significantly increases elasticity, facilitates stuffing, and ensures uniform filling along the entire loaf length.

When using shirred casing, the shirred sticks must be fully submerged in water (secured under a grid) at +18°C to +25°C for at least 40 minutes.

Casing consumption should be calculated according to the planned production volume. In case of partial use, the casing should be kept in a container with cold water and used within 24 hours.

Technological Recommendations for Sausage/Ham Production Using Polyamide Casings

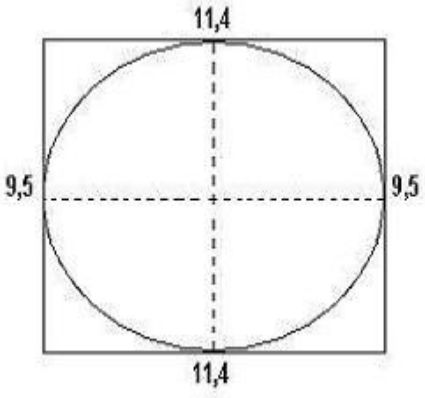
Since the casing is also intended for high-yield ham products, the requirements of the technological instruction must be strictly followed—especially regarding the use of moisture-retaining additives applied

during ham injection. This ensures high yield, prevents jelly/broth swelling ("broth-fat pockets"), and eliminates casing separation during storage.
Stuffing and Clipping; Forming in Loaves, Press Molds, and Netting

Cooked sausages in loaves

For cooked sausages in loaves, stuffing into Pentaflex-Shape® casing is recommended within an overstuffing range of 15–25% (selected depending on the required loaf shape).
Cooked hams in press molds
Cooked hams may also be formed in Pentaflex-Shape® casing in press molds of various configurations. Overstuffing in press molds is 15–25%. Product length depends on mold dimensions.
Requirements for forming hams in press molds
Cutting the casing
Depending on the forming design and cell dimensions, the casing is cut to length. The casing length for one mold (cell) should be 10% longer than the mold length. Cutting may be performed manually. For convenience, the prepared section is clipped on one side, filled, and then clipped on the other end.
Sections of 20 m or longer may be stuffed continuously followed by clipping into loaves. In this case, loaf length must match the mold length.

Selecting casing diameter for the mold
Before forming, the casing diameter must be selected according to the mold size. The perimeters of the mold cross-section and the casing cross-section should be equal. Using the formula below, the required casing diameter can be calculated with the planned overstuffing percentage.



Example
Mold dimensions:
l = 31 cm, h = 9.5 cm, m = 11.4 cm

Mold perimeter:
11.4 + 11.4 + 9.5 + 9.5 = 41.8 cm
Perimeter of casing cross-section to fit the mold:
π × D = 41.8 cm (where π = 3.14)
D = 41.8 / π = 13.3 cm (133 mm)

Perimeter of the cross-section including overstuffing:

at 10% → nominal diameter 119.7 mm
at 15% → nominal diameter 113.0 mm
at 17% → nominal diameter 110.3 mm

These calculations are theoretical; therefore, when selecting casing diameter, all parameters must be considered (overstuffing %, mold size, etc.).

Clipping of Loaves

The casing can be used on automatic (ALPINA, POLI-CLIP, TECHNO-PACK), semi-automatic equipment, all KOMPO clipper types, as well as manual clippers.

Placing into Molds

After clipping, loaves are placed into molds. If several loaves are placed into one cell, the end parts must fit tightly against each other.
When placing, the loaf surface must protrude above the mold edge by 1.0–1.5 cm to obtain a clear imprint. The molds are then pressed from above with a lid.
Ham loaves may also be hung on hangers/frames.

Packaging in Combination with Netting

Using the casing together with netting is an additional solution to improve sausage appearance. Equipment set-up for (casing + netting) includes adjustment of the braking ring and casing filling speed. Netting size must match the casing diameter.
Special netting weave allows formation of a non-uniform relief (alternating bulges and constrictions), making it possible to utilize the recommended overstuffing percentage to the maximum. Specifics of working with casing + netting are described in the technological scheme.

Thermal Processing

Thermal processing must follow the scheme:
preheating – cooking – showering – cooling.
Due to gas-impermeability of the casing, the roasting stage is excluded. To ensure proper color formation, stepwise cooking with gradual temperature increase must be applied. Cooking should start at 50–55°C.
Final stage: cooking until full readiness — 72°C inside the loaf for 10–15 minutes.
The number of temperature steps depends on loaf diameter: the larger the diameter, the more steps required. Step duration is determined by the manufacturer based on technological instructions and equipment capabilities.
After cooking, products must not be cooled with cold air. Rapid air cooling dries the casing and may cause surface wrinkling. Drafts must be eliminated until complete cooling.

Cooking in kettles

Cooking may also be performed in boiling kettles (including molds with products). Follow the technological instructions and casing usage requirements:
load molds/loaves into water at +55°C to +60°C;
loading into water at +80°C is strictly prohibited (may cause premature casing shrinkage and loaf deformation);
molds/loaves must be fully submerged;
temperature increase must be gradual, in stages;
when loading subsequent batches, water temperature must not exceed +60°C;
product readiness is confirmed by an internal loaf temperature of +72°C.

Cooling

After cooking, sausages/hams are cooled in two stages:
Frames with loaves (or molds) are cooled with tap water to an internal product temperature of +25°C to +30°C. Cooling may be performed by showering or by full immersion of molds in water.
After water cooling, products are transferred to chilling chambers for final cooling to an internal temperature of 0°C to +6°C.
After complete cooling, hams are removed from the molds. When the casing is used for ham packaging, no additional packaging is required—products may be delivered to retail in this casing.

Slicing and Casing Removal

Pentaflex-Shape® casing is easily removed from the loaf.
Before slicing, both clips must be cut off to reduce casing tension and prevent tearing.

Packaging and Storage of Products

After cooling, hams and sausages are transferred to storage facilities for warehousing and distribution. Storage temperature must comply with the technological instructions for the specific product type.
Products with clean, dry surfaces are packed into sanitized containers in compliance with maximum permissible net weight and sent for storage/distribution.
During storage, significant temperature fluctuations are not allowed to prevent condensation on the product surface.
In retail outlets, products must be removed from transport packaging and placed in refrigerated cabinets, display cases, etc.