

## Instructions for Use Pentaflex-Universal® Multilayer Heat-Shrink Synthetic Casing for dairy products packaging

### Purpose

Pentaflex-Universal® casing is manufactured in accordance with TU U 25.2-20620489-006-2003 and is intended for packaging of: processed cheeses, butter, spreads, mixed dairy products, ice cream, condensed milk, boiled condensed milk, and other similar products.

### Advantages

Compared to viscose-reinforced, natural, and protein casings, Pentaflex-Universal® offers:

biological inertness;  
high barrier properties;  
high mechanical strength;  
elasticity;  
low oxygen and water vapor permeability;  
operating temperature range of products in casing from  $-30^{\circ}\text{C}$  to  $+115^{\circ}\text{C}$ ;  
no losses during thermal processing;  
extended shelf life of packaged products.

### Storage at the Manufacturing Facility

The casing is supplied in rolls and in shirred form. In order to maintain stable casing properties during possible temperature fluctuations occurring during transportation, the casing (both in rolls and shirred form) is placed in a polyethylene bag before being packed into cartons.

The casing 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  $+25^{\circ}\text{C}$  and relative humidity not exceeding 80%.

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

The casing is frost-resistant and withstands temperatures down to  $-30^{\circ}\text{C}$ . Mechanical abrasion must be avoided.

**The guaranteed shelf life of the casing is 36 months.**

### Preparation of the Casing for Use

Casing stored at temperatures of  **$0^{\circ}\text{C}$  or below** must be conditioned at room temperature for at least 24 hours before opening the packaging and use.

**Conditioning at room temperature is necessary to adapt the casing to operating production temperatures and ensure readiness for use.**

To accelerate preparation during cold periods, the casing must be kept at room temperature for at least 24 hours prior to product packaging.

For faster adaptation, shirred casing should be conditioned under these conditions with the carton and polyethylene bag opened in advance.

**When preparing casing supplied in rolls (unwinding and 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.**

**Cutting of the casing prior to use must be carried out outside the production area, as high humidity may cause premature moistening and subsequent sticking of the casing in the roll.**

**During unwinding of such rolls, casing damage or rupture during filling may occur.**

Before use, Pentaflex-Universal® casing in rolls must be cut into sections of the required length and soaked in water at a temperature of  $+18^{\circ}\text{C}$  to  $+25^{\circ}\text{C}$  for 30 minutes.

To accelerate soaking for ice cream packaging, especially during winter, taking into account product characteristics, an increase in soaking water temperature from +25°C up to +38°C is permitted. The exact temperature is determined experimentally by the manufacturer depending on production conditions and properties of the packaged product. The packaging process is carried out in accordance with the technological scheme for the specific product.

After cutting, remaining casing on rolls must be stored in the original factory packaging (in polyethylene bags).

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 both inner and outer surfaces are evenly wetted. **This significantly increases casing elasticity, facilitates filling, and ensures uniform distribution of the product mass along the entire length of the loaf.**

When using stirred casing, the stirred sticks must be completely submerged in water (covered with a lid). **Soaking time must be at least 40 minutes.**

In case of partial use, the casing should be kept in a container with cold water and used within 24 hours.

**Pentaflex-Universal® casing may be used for packaging dairy products without soaking (or with only surface moistening), provided that during use—depending on the packaged product and processing stages (filling, clipping, cooking, freezing)—no casing rupture, loaf deformation, or other defects occur that do not meet customer requirements.**

### **Technological Recommendations for Dairy Products Packed in Polyamide Casings**

Production of dairy products packed in polyamide casings must comply with the applicable technological **instructions depending on the product type.**

The multilayer polyamide heat-shrink casing Pentaflex-Universal® is strong, elastic, and has excellent gas- and moisture-barrier properties. It ensures product yield by eliminating losses and protects products from mechanical damage, contamination, moisture penetration, microorganisms, and other factors leading to spoilage.

The casing provides products with the required shape and dimensions convenient for processing, storage, and retail distribution.

### **Casing Filling with Pre-Soaking**

Filling is recommended with overstuffing relative to the nominal caliber within the recommended stuffing diameter (RSD) range of 4–7% (selected experimentally depending on the product).

Example: when using a casing with a nominal diameter of 45 mm, the recommended diameter of the filled loaf is 48 mm, corresponding to 7% overstuffing.

RSD control is carried out periodically by measuring the loaf diameter with a calibrated measuring tape. The strength and elasticity of Pentaflex-Universal® casing allow easy filling, resistance to hydraulic shock during clipping, and prevent rupture during thermal processing (cooking, freezing).

**Depending on the characteristics of the packaged product, reduction of overstuffing or filling within the nominal casing diameter is permitted.**

**When using casing without soaking, filling may be carried out within the nominal diameter or with slight overstuffing (selected experimentally) depending on product requirements.**

### **Clipping**

Pentaflex-Universal® casing is suitable for use on automatic (POLI-CLIP, ALPINA, TECHNO-PACK), semi-automatic equipment, as well as for manual tying.

### **Thermal Processing**

Thermal processing of products is carried out in accordance with applicable technological instructions depending on the product type.

### **Packaging and Storage**

Dairy products packaged in Pentaflex-Universal® casing are placed into containers and, after cooling or freezing, transferred to storage facilities for warehousing and distribution. Storage temperature must comply with technological instructions for the specific products.

In retail outlets, the required storage temperature conditions must be ensured. Loaves must be removed from transport packaging and placed in refrigerated cabinets, display cases, etc.