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# AMITEX Sonet Cord and AMITEX Sonet Band CASINGS

Process Operating Manual



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## 1. APPLICATION

This Process Operating Manual describes the process of production of cooked sausage and ham products with the use of the **AMITEX Sonet Cord** and **AMITEX Sonet Band** casings.

The **AMITEX Sonet Cord** and **AMITEX Sonet Band** are made and consist of a seven-layer heat-shrink barrier casing and a non-stretchable cotton cord or a plastic band.

In the process of molding the casing is stretched under the pressure of the product, while the non-stretchable cord or band prevents a uniform stuffing. As a result, the chub displays protrusions corresponding to the cord or band pattern on the casing.

The **AMITEX Sonet Cord** and **AMITEX Sonet Band** casings are designed for production, packing, storage and sale of sausage and ham products, processed cheeses, food animal fats, margarines and other food products intended for retail trading in the form of whole chubs.

The recommended storage term for top-, first-, and second-grade cooked sausages made and packaged into the **AMITEX Sonet Cord** or **AMITEX Sonet Band** casings is not more than 60 days at a temperature from 2 to 6°C and air relative humidity not higher than 75%.

## 2. PROPERTIES AND ADVANTAGES OF THE AMITEX SONET CORD AND AMITEX SONET BAND CASINGS

**2.1.** The **AMITEX Sonet Cord** and **AMITEX Sonet Band** are special types of a matte barrier casing designed to make the product attractive through an unusual shape of the chub.

**2.2.** A creative technical approach to the production of the casings makes the finished products ready to use:

- the **AMITEX Sonet Cord** and **AMITEX Sonet Band** casings need no additional technical devices (applicators);

- the **AMITEX Sonet Cord** and **AMITEX Sonet Band** casings exclude the possibility of accumulation of the unused leftovers of casings, cords and bands, since the casing and the cord or band are consumed simultaneously and in equal proportions;

- there is no danger of separation of the cord or band after a prolonged soaking of the casing;

- the process of attachment of the cord or band to the casing involves the preliminary formation of convex cells on the casing, which facilitates the subsequent molding of the sausage products.

**2.3. Mechanical strength** of the casings, and the tight adhesion of the cord or band to the casing, make it possible to mold the chubs with the use of high-capacity automatic or semi-automatic clippers to ensure stability of the shape and fixed weight of the chubs at high rates of molding.

**2.4. Elasticity** of the casings provides for a significant overstuffing relative to the nominal caliber, and reduces the consumption of the casing per ton of the finished products in comparison with the usual barrier casings.

**2.5. Low permeability to oxygen and water vapor** is ensured by careful selection of polymers and provides for:

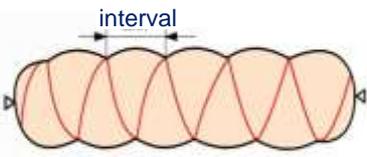
- zero losses during the thermal processing and storage of meat and sausage products;
- microbiological stability of the products during storage;
- retardation of the oxidation processes that cause rancidification of fats;
- excellent selling appearance and preservation of sausage products throughout the shelf life.

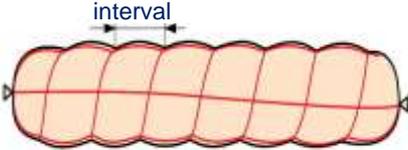
**2.6. Physiological safety:** the **AMITEX Sonet Cord** and **AMITEX Sonet Band** casings are impervious to microbiological degradation, because their materials are inert to the action of bacteria and mold fungi. This facilitates storage of the casing and improves the hygienic characteristics of both the casing itself, and of the sausage production.

### 3. ASSORTMENT

**AMITEX Sonet Cord** is a casing decorated with a cotton cord of various weaves. The color of the cord is cream or red. The distance between the spiral turns (pitch of the spiral) depends on the caliber of the casing (see Table 1).

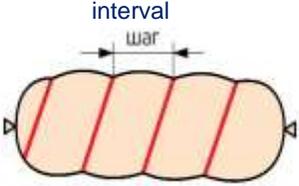
Table 1

<i>Casing</i>		<i>Caliber</i>	<i>Spiral pitch</i>	
<b>Amitex Sonet Cord 2</b>	two crossing spiral cords	Ø 40 - 50 mm		
		Ø 51 - 60 mm	40±5 mm	
		Ø 61 - 70 mm	50±5 mm	
		Ø 71 - 80 mm	60±5 mm	
			70±5 mm	

<b>Amitex Sonet Cord 5</b>	four cords imitating manual tying of sausage chubs	Ø 40 - 50 mm		
		Ø 51 - 60 mm	40±5 mm	
		Ø 61 - 70 mm	45±5 mm	
		Ø 71 - 80 mm	50±5 mm	
			55±5 mm	

**AMITEX Sonet Band** is a casing, decorated with a plastic band. The color of the band is gold, cream, or red. The band width is 0.5 cm. The distance between the spiral turns (pitch of the spiral) depends on the caliber of the casing (see Table 2).

Table 2

<i>Casing</i>		<i>Caliber</i>	<i>Spiral pitch</i>	
<b>Amitex Sonet Band 1</b>	one spiral band	Ø 40 - 50 mm		
		Ø 51 - 60 mm	45±5 mm	
		Ø 61 - 70 mm	50±5 mm	
		Ø 71 - 80 mm	55±5 mm	
			60±5 mm	

Colors of the **AMITEX Sonet Cord** and **AMITEX Sonet Band casings**: beige, bronze, red, gold, smoke, smoke 3, pink 4, light walnut, walnut, dark walnut.

The **AMITEX Sonet Cord** casing can be used for single- or double-sided printing in a single color, multicolor or CMYK printing with the use of UV cured inks.

Printing is applied by the flexographic method. The inks are resistant to boiling, fats, and mechanical action.

Printing on the finished casing may cause the appearance of crazing-like hairline cracks, due to the casing manufacturing technique.

The casing can be supplied in:

- rolls;
- shirred sticks.

## 4. CASING USE TECHNOLOGY

### 4.1. Storage and transportation of the casing

4.1.1. The casing must be stored in the original packing in dry, clean, and cool rooms (at a temperature from 5 to 35°C, and air relative humidity not more than 80%) conforming to the sanitary-hygienic standards for the meat processing industry.

4.1.2. It is recommended to open the manufacturer's packing just immediately before use of the casing.

4.1.3. During storage and transportation, protect the casing against exposure to high temperatures (above 40°C) or direct sunlight.

4.1.4 If the casing was stored at a temperature below 0°C, then prior to use keep it in its original packing at room temperature for at least 24 hours.

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

4.1.6 Throughout the technological cycle it is important to protect the casing from damages.

### 4.2 Preparation of the casing for use

To provide for elasticity and uniform stuffing of the **AMITEX Sonet (Cord, Band)** casing, it must be pre-soaked in potable water at a temperature of 25 - 30 °C. The use of higher temperatures will cause an uncontrolled heat shrinkage of the casing and reduction of its length and caliber.

Take care to ensure that the water penetrates inside the tube and wets not only the outer, but also the inner surface of the casing.

Unshirred casings must be cut into sections of required length before soaking. Keep the spool vertical throughout the unwinding to avoid damaging the ends.

Soak shirred casings without removing the net.

Casing soaking time:

- not less than 60 minutes for casings cut into lengths;
- not less than 90 minutes for shirred casings.

If too much casing was soaked, remove it from water, drain the excessive water and leave the wet casing away from any sources of heat or air draft. On the next day, soak the casing again before processing.

### 4.3 Preparation of the batter

During the thermal processing the sausage stuffing inside the **AMITEX Sonet (Cord, Band)** casing does not lose 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 properties of the casing.

When sausages are made, it is recommended to reduce the added moisture by 10% of the batter weight, as compared with the recipes for the natural, collagen, and viscose-reinforced casings.

In the development of new recipes, determine the quantity of the added moisture with regard to the moisture-retaining properties of the additives (emulsifiers, stabilizers, gelling agents, plant proteins, etc.), the raw meat quality, and the technical condition of the equipment, paying special attention to optimal binding of proteins, fats, and water.

All technological measures aimed at increased binding of water (raising of the yield) lead to raising of the pressure in the batter during the thermal processing. Batter with an elevated percentage of meat substitutes tends to swell more. In order to preserve the ability of the batter to bind significant amounts of water and to prevent rupture 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.

The batter for hams must be prepared in accordance with the regulatory documentation applicable to these products.

#### 4.4. Molding of sausage products

The **AMITEX Sonet (Cord, Band)** casing is designed for automatic, semi-automatic or manually-operated equipment for stuffing and clipping, but can also be used or manual tying.

***Never puncture the chubs (perforate the casing). The casing will rupture, if punctured.***

When processing the **AMITEX Sonet (Cord, Band)** casing, take into account the following:

- tightly fill the casing with emulsion, guided not only by the finished product caliber, which is difficult to measure, but also by the acceptable appearance of the product;

- depending on the molding equipment capacity, the overstuffing relative to the nominal caliber should be **20 - 25 %** for **AMITEX Sonet Cord**, and **25 - 30 %** for **AMITEX Sonet Band**;

- the cord and the band impede the passage of the casing through the braking block, and add extra thickness to the clipped bundle, therefore it is very important to select the correct clip size in accordance with the recommendations specified in Table 4;



- adjust the clipping pressure, considering the greater volume of the clipped bundle; the clip must securely hold the ends of the chub without damaging the casing;
- when using automatic clippers with displacers, adjust the displacer aperture;
- adjust the clipper blade operation and keep it sharp enough to cut through the whole bundle (casing + cord or band). If the blade has become blunt and does not cut through the cord, do not try to tear the cord with hands, because this may detach the cord from the casing. Use a cutting tool instead;
- prior to adjustment of the overstuffing ratio, release the clipper brake to the maximum. If the clipper is fitted with two brake rings, in some cases it is expedient to use one ring only;
- it is possible to use a brake ring together with a greater size thrust ring. E.g.: horn  $\varnothing$  28, brake ring  $\varnothing$  28, thrust ring  $\varnothing$  36. This ensures a stable and smooth passage of the casing through the braking unit, and uniform overstuffing;
- for symmetrical filling of the chubs, adjust the nozzle alignment relative to the displacer aperture;
- comply with the recommendations of the clipping equipment manufacturers.

Table 3

Recommended clip types for the **Amitex Sonet (Cord, Band)** casings

Caliber	POLY-CLIP		TIPPER TIE	TECHNOPACK		COMPO	CORUND
	Clip interval 15 interval 18	Clip series S	Clip interval 15 interval 18	Clip series E	Clip series G	Clip series B, BP	
40	15-9-5x1.75 18-9-5x2.0	632 735	15 /9-5x1.75 18/9-5x2.0	220 410	175 370	B 2, BP2	2.5x13.6x14 XE220
45	15-9-5x1.75 18-9-5x2.0	632 735	15/9-5x1.75 18/9-5x2.0	220 410	175 370	B2 BP2	2.5x13.6x14 2.5x13.6x15 XE220
50-55	15-10-5x2.0 18-9-5x2.0	632 735	15/10-5x2.0 18/9-5x2.0	220 410	175 370	BP2	2.5x13.6x15 XE220



60-65	15-10-5x2.0 15-11-5x2.2 18-9-5x2.0	638 735 844	15/10-5x2.0 15/11-5x2.2 18/9-5x2.0	220 420	175 200 370	BP2	2.5x13.6x15 2.5x13.6x16 XE220
70	18-9-5x2.0 15-11-5x2.2 18-10-5x2.0 18-11-5x2.2	638 735 844	18/9-5x2.0 15/11-5x2.2 18/10-5x2.25 18/11-5x2.25	220 420	175 200 370	BP2 BP3	2.5x13.6x15 2.5x13.6x16 XE220
75	18-10-5x2.0 18-11-5x2.2 18-12-5x2.5	735 740 844	18/11-5x2.0 18/11-5x2.25 18/12-5x2.5	220 230 420	200 225 370	-	2.5x13.6x15 2.5x13.6x16 XE220 XE230
80	18-11-5x2.2 18-12-5x2.5	740 844	18/11-5x2.25 18/12-5x2.5	230 420 430	225 390	-	-

Note. The POLY-CLIP FCA and TIPPER TIE TT1815, TT1512, SVF 1800 and COMPO CN-501 clippers use blocks, each of which corresponds to a certain clip type indicated in the Table. In order to determine whether the clip matches the block, see recommendations of the manufacturer and the technical description of the clipper.

#### 4.5 Thermal processing

Thermal processing of sausages in the **AMITEX Sonet (Cord, Band)** casings consists in cooking and cooling.

Thermal processing of sausages can be made in heat chambers of various types, or in stationary boiling cauldrons.



### 4.5.1. Cooking

For the purposes of thermal processing in heat chambers, it is recommended to use either staged cooking, or delta cooking. In either case, cooking should start at a temperature of 50-55°C to trigger the coloring reactions. Higher starting temperatures may cause separation of the emulsion and color defects (grey rings).

**Staged cooking** consists in step-by-step raising of the temperature in the heat chamber, as the temperature in the center of the product reaches the temperature of the heating medium. The number of 'stages' is determined by the product diameter– the greater the caliber, the greater is the number of the stages. The first stages consist in heating at moderate temperatures – 50, 60, 70 °C to ensure slow coagulation of proteins and redistribution of heat throughout the volume. The last stage is bringing of the product to consumption readiness (72 °C in the chub core, during 10 - 15 minutes).

**Delta cooking** creates more favorable conditions for uniform heating of sausages. The difference between the chamber temperature and the product temperature at the beginning of the process is 15 – 20 °C, reducing to 5 - 8 °C by the end of the process. Delta cooking in production conditions requires a longer heating, but yields higher quality products. The duration of cooking depends on the consumption readiness point of the product (72 °C in the chub core, during 10 - 15 minutes).

The following is an example of thermal processing for 60mm caliber sausage chubs:

- 55°C in heat chamber at 100% humidity - 25 minutes.
- 65°C in heat chamber at 100% humidity - 25 minutes.
- 75°C in heat chamber at 100% humidity - 35 minutes, or until 60°C in chub core is reached.
- 80°C in heat chamber at 100% humidity, until 72°C in chub core is reached.

For cooking in cauldrons it is recommended to:

- load the chubs in the water at a temperature of 55 – 60 °C, in order to prevent the uncontrollable shrinkage and deformation of the chubs;
- keep the sausages underwater, and move them for uniform cooking;
- before loading of each new batch of sausages, reduce the water temperature in the cauldron to 60°C.

### 4.5.2. Cooling

Upon completion of the cooking process, the sausages must be immediately cooled. The first stage of cooling is spraying with cold water (time-delayed sprayers



may be used) to bring the chub core temperature down to 25 - 35 C. After spraying, the sausage must be air-dried before putting it into a cold store.

Cold air cooling is not allowed. Exclude any exposure of the finished products to air drafts until completely cooled, because this may cause wrinkles on the surface.

#### **4.6 Transportation and storage of sausage products**

Transportation and storage of sausage products manufactured with the use of the **AMITEX Sonet** casing shall be in accordance with the regulatory documentation for these products.

### **5 MANUFACTURER'S GUARANTEE**

5.1. The Manufacturer guarantees conformity of the casing with the Specification requirements subject to compliance with the required conditions of transportation and storage at the user's warehouse, and preservation of the integrity of the original packing.

5.2. The shelf life of the casing is 3 years from manufacture subject to compliance with these requirements; the shelf life of the casing with UV-printing is 2 years from manufacture.

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