

INSTRUCTIONS FOR USE

ENGLISH

INFORMATION, RECOMMENDATIONS, AND INSTRUCTIONS
FOR USE WRAPPING FILM
MET/MTCA/ZILL 10-102- REV0 – 12/2019

1 FIELD OF APPLICATION

This document is applicable for wrapping films used for individually or continuously wrapping cylindrical or square bales of fodder in order to obtain an airtight envelope which will allow the anaerobic fermentation process necessary for the production of silage. These films must be removed from the fields after use (refer to § 8).

2 PURPOSE AND SPECIFIC FEATURES OF WRAPPING FILMS

“Wrapping films” are films intended for the protection of moist fodder. These are blown stretch films. **These films must not be used for any other purpose, e.g. for the preservation and/or protection of dry fodder (for example, straw).**

3 CHARACTERISTICS OF THE WRAPPING FILMS

3.1 Dimensional characteristics

Nature of the characteristics	Requirements	Measurement methods
Average thickness/standard thickness tolerances **	-8%, +12%	ISO 4593
One-off thickness/standard thickness tolerances **	-20%, +28%	
Width tolerances	+/- 5 mm (from the declared standard width**)	ISO 4592
Length tolerances	≥ 99% (from the declared standard length**)	EN 14932 § 8.4

**Standard thickness, standard width and standard length: thickness, width and length values indicated on the spool label.

3.2 Technical characteristics

The technical characteristics of the film on new materials are in compliance with the values specified in the EN 14932 standard, Table 2.

3.3 Service life

3.3.1 Categories of film

There are two class of films that are marketed, which correspond to the characteristics described in the table below.

For each category, the film must have a minimum service life **measured in a laboratory** in an UV-accelerated ageing chamber in compliance with the table below.

Category	Minimum duration in hours inside the WOM chamber (0.51 W/(m ² .nm)) According to the NF EN 14932 standard	Minimum duration in hours inside the SEPAP chamber According to the NF EN 14932 standard
Category A: Maximum service life of 12 months for a climatic zone with a total solar exposure ≤ 130 KLy/year	1,780	640
Category B: Maximum service life of 12 months for a climatic zone with a total solar exposure of 130 to 180 KLy/year	2,480	870

3.3.2 Determination of the category of film to be used depending on the climatic zone and the expected lifetime

3.3.2.1 Geographic zones

The lifetime measured in a laboratory (refer to point 3.3.1) does not correspond to the actual lifetime on-field, after using the film. The on-field lifetime depends on the geographic zone where the Wrapping film is used.

For each geographic zone, the EN14932 standard provides information on the correlation between the on-field lifetime expressed in months and the lifetime measured in the accelerated ageing chamber (refer to 3.3.1).

Duration of exposure in hours, in the accelerated ageing chamber in WOM/SEPAP			
Climatic zone	Total solar exposure	Durability of the film	
		Examples of geographic zones	12 months
CZ1	Up to 4.2 GJ/m ² /year up to 100 kLy/year	Northern Europe	1,370 / 470
CZ2	> 4.2 and up to 5.4 GJ/m ² /year >100 and up to 130 KLy/year	Central Europe / France / Northern Italy	1,780 / 640
CZ3	> 5.4 and up to 6.7 GJ/m ² /year > 130 and up to 160 KLy/year	Andalusia / Sicily / Southern Italy North Africa	2,200 / 800

3.3.2.2 Expected lifetime

The lifetime expected by the user, expressed in months, begins on the date of installation of the film for the wrapping.

3.3.2.3 Choice of category of the film to be used

In order to determine the category of the film to be used depending on the geographic zone of installation and the lifetime which you expect, please refer to the table below.

Category of the film to be used depending on the geographical zone and expected service life		
Climatic zone	Expected Lifetime	
	Overall solar exposure	12 months
CZ1	Up to 4.2 GJ/m ² /year up to 100 kLy/an	A
CZ2	> 4.2 and up to 5.4 GJ/m ² /an >100 and up to 130KLy/year	A
CZ3	> 5.4 and up to 6.7 GJ/m ² /year > 130 and up to 160 KLy/year	B
CZ4	> 6.7 up to 7.5 GJ/m ² /an > 160 up to 180 KLy/year	B

1 KLy = 0.04184 GJ/m²

However, to know the exact solar radiation exposure of your zone of use, you must consult your local weather station.

3.4 The factors for degradation of wrapping films

A multitude of factors can accelerate or delay the degradation of the film after the wrapping operation, and therefore affect its service life. The known factors as of today are as follows:

3.4.1 The intensity of solar radiation

All other conditions being equal, the film will have a shorter service life in a geographical zone with higher solar radiation (for example: Southern Europe) than in a zone with lower solar radiation (for example: Northern Europe).

The same applies if the film is used in the same geographical zone in summer when the sun's rays are stronger and the days are longer, than in spring or autumn, when the sun's rays are not as strong and the days are not as long.

3.4.2 Level of temperatures

All other conditions being equal, a film will have a shorter service life in a geographical zone with a higher temperature (for example: Southern Europe) than in a zone with a lower temperature (for example: Northern Europe).

The same applies if the film is used in the same geographical zone in summer when the temperatures are higher, than in spring or autumn, when the temperatures are lower.

3.4.3 Nitrogen oxides

Excessive nitrogen oxides are harmful for the fodder and the film.

In our experiences, an excess of nitrogen oxides may be caused by:

- excessive fertilisation, using nitrogen-based products, of the fodder fields and/or cutting of the fodder done too soon after fertilisation,
- and/or an excessively low content of dry matter in the fodder at the time of cutting.

An excess of nitrous oxides can:

- harm the quality of the fodder by reducing its nutritive value,
- harm the film itself by causing premature degradation, thus making it lose its characteristics of impermeability to oxygen and water, which in turn results in the degradation in the quality of the fodder, or even complete loss.

In certain green-coloured films, we have observed that excessive nitrous oxides can result in a change in the colour of the film.

Our Company cannot be held liable for damage to the film and/or damage or loss of fodder if exposed to an excessive amount of nitrous oxides.

3.4.4 Attacks by animals

The film is not resistant to attacks by animals (birds, cats, foxes, rodents, etc.). It is thus highly recommended to cover the stacks of wrapped bales with a protective net suitable for this purpose, and to put up a fence around these stacks and use anti-rodent products. The user must remain vigilant and must repair any damage caused by animals. Any perforation of the film will result in oxygen entering inside the bale, which will affect the state of preservation of the silage product. The user must thus regularly check the bales for signs of perforation or external damage. In the event of perforation, the user must patch up these holes using a specially made scotch tape and quickly use up the perforated bales, if they can still be used for consumption by cattle.

Our Company cannot be held liable for damage to the film and/or damage or loss of fodder caused by animals perforating the film.

3.4.5 Mechanical damage caused by bad weather

The film is designed to resist only a certain level of impact (refer to § 3.2). When it is hailing, this level of impact may be exceeded and thus the film may be perforated. Hence, after it hails, the user must very carefully check whether the bales show any signs of being perforated. The hail may have resulted in micro-perforations which are rather difficult to detect. Micro-perforation of the film will result in oxygen entering inside the bale, which will affect the state of preservation of the silage product. In the event of perforation, the user must patch up these holes using a specially made scotch tape and quickly use up the perforated bales, if they can still be used for consumption by cattle.

Our Company cannot be held liable for damage to the film and/or damage or loss of fodder caused by hail perforating the film.

3.4.6 Using phytosanitary treatments near the place of storage of the bales

The bales must be stored in a zone away from phytosanitary treatments.

Certain phytosanitary products act as pro-degradation agents for the wrapping film. Certain metallic-organic molecules have been identified as pro-degradation agents (iron, zinc, copper, manganese, etc.), as well as chlorinated and/or halogen and/or sulphur-based agents.

These phytosanitary products harm the film by causing premature degradation, thus making it lose its characteristics of impermeability to oxygen and water, which in turn results in the degradation in the quality of the fodder, or even complete loss.

Our Company cannot be held liable for damage to the film and/or damage or loss of the harvest due to the inappropriate use of phytosanitary treatments.

4 TRACEABILITY AND RECEIPTS TO BE RETAINED

The traceability of agricultural inputs is a European requirement.

That is why all our wrapping films are identified in order to ensure the traceability of the product throughout its life cycle.

This identification is ensured through a label which is attached to each roll and/or on the packaging, as well on this document attached to each roll (either in the mandrel, or in the packaging, or in the first roll of the roll).

Farmers and/or service providers, who are responsible for the installation of the film, must retain the label and a sample (bottom of the roll of about ten metres retained in its packaging) for every 10 rolls, and a copy of this document till the silage product is consumed.

5 EXPIRATION DATE AND CONDITIONS OF STORAGE OF THE FILM BEFORE USE

5.1 Expiration date (DLU)

All "wrapping films" must be used before the expiration date mentioned on the label attached to the roll and/or on the packaging unit.

Beyond this period, the film must no longer be used.

It is recommended to use the "wrapping film" within 12 months following the date of delivery to the farmer.

Our Company cannot be held liable for any kind of damage caused by a "wrapping film" sold or used after the expiration date.

5.2 Storage conditions

The primary factors of degradation of the film are light and temperature, and also mechanical damage.

Hence, before using the spools, they must be stored upright in a temperate, ventilated and closed-off area, sheltered from light, heat (temperature < 35°C) and mechanical damage.

The film must be stored in its original packaging.

Insofar as possible, when you start using a roll, ensure that it is used completely in order to prevent any subsequent mechanical deterioration. If this is not possible, the remainder of the roll must be stored in its original packaging and in the same conditions as those mentioned above.

Our Company cannot be held liable for damages caused by a film owing to the fact that it was not stored in the conditions stated above.

6 OPERATIONS ON THE FILM

The wrapping film must not undergo any transformation, surface, heat or chemical treatment or any shaping.

Our Company cannot be held liable for damages caused by a film owing to the fact that it had undergone any of the abovementioned operations.

7 CONDITIONS TO BE COMPLIED WITH

Our company cannot be held liable for damages caused by a "wrapping film" owing to the non-compliance with one or several of the conditions of use stated below.

7.1 Stage of the fodder

The Wrapping operation must be carried out at the correct growth stage of the fodder, which is:

- for grass, at the beginning of emergence,
- for clover, at the time of formation of the buds,
- for alfalfa, at the young, less woody stage,
- for other fodder, refer to the recommendations of the Chamber of Agriculture or Technical Institutes.

Fodder cut when it is too young will have reduced food value and not much sugar. Harvesting the fodder at a woody stage will result in an increase in the trapped air, an improper conservation of the fodder, and a reduction in its digestibility. Fodder cut at a stage when it is too late will have reduced food value and will be woody fodder.

7.2 Mowing and tossing the fodder

The presence of earth in the fodder inevitably results in a contamination by undesirable bacteria as well as mushrooms. The mushrooms result in mould which can degrade the food value of the fodder, or even prove toxic for the animals. In order to limit this risk of contamination by earth, it is necessary to eliminate molehills in the spring and at the time of mowing, and to cut the fodder at least 10 cm above the soil.

The mowing must not take place earlier than 10 weeks after the application of liquid manure, dung, or nitrogen-based fertiliser in order to avoid, in particular, the formation of nitrous oxides (refer to § 3.4.3), or contamination by undesirable bacteria as well as mushrooms, which can reduce the nutritive value and/or result in the loss of fodder or could poison the cattle.

In order to achieve proper fermentation and good nutritive value of the fodder, it is necessary to:

- cut the fodder in fair weather and ensure that the baling is also done in fair weather, and not when it is humid,
- ensure that the content of dry material is between 35 and 55%.

A content of dry material < 35% may result in:

- incomplete fermentation (particularly as the rate of sugar is low),
- shape of the bales being heterogeneous,
- an increase in the juices, which leads to food loss (possibly toxic),
- difficult and unstable storage,
- improper preservation in general.

A content of dry material > 55% may result in:

- loss of sugar,
- modification of the fermentation,
- increased risk of formation of mould.

The windrows before baling of the fodder must be uniform and homogenous. Their width must be determined depending on the nature of the baler which will be used (round bale or square bale baler). Refer to the manufacturer's instructions for use of the baler.

If the farmer wishes to use additives for preservation or to increase the nutritional value of the

fodder, he must ensure that they are compatible with the wrapping technique by contacting the provider of the additives.

7.3 Baling the fodder

To ensure the proper application of the wrapping film, the wrapping bales must individually and among themselves:

- be homogenous and uniform,
- have the proper density,
- be cylindrical or like a parallelepiped (square-like) in shape,
- be identical in size.

In case of continuous wrapping, in addition to the improper application of the film, the differences in shape and size may result in breakages of the film between the bales at the time of the wrapping operation or later on.

The quality of the shape of the fodder bales, the standardisation of their dimensions, homogeneity and density depend on the baler and its conditions for use (proper rate of compression, constant and suitable speed). Regarding these points, the farmer must refer to the recommendations of the baler's manufacturer.

To create fodder bales which must then be wrapped, it is prohibited to use types of string or nets other than those made of plastic and polyolefin. It is particularly prohibited to use string or nets made of processed natural fibres like sisal or hemp which can result in a chemical reaction with the polyethylene, which results in the degradation of the plastic film.

It must be noted that the baling does not allow increasing the dry material content in any case.

7.4 Preparation and maintenance of the wrapping machine

Generally, it is recommended to ensure the proper maintenance of the wrapping equipment by scrupulously following the manufacturer's recommendations.

At the beginning of each wrapping operation, it is necessary to check:

- the degree of wear of the parts exposed to wear and tear (springs, bearings, wheels, gables, sleeves, etc.),
- proper lubrication of all parts which have a lubricator: chains, gables, couplings, etc.
- the rotation speeds of the moving parts and particularly the platforms and arms,
- the cleaning of the pre-stretching wheels which must not have any deposits of glue,
- the adjustment of the height of the pre-stretching system (align the centre of the spool and the centre of the bale on the same axis),
- the adjustment of the pre-stretching system to obtain between 50% and 70% lengthwise stretching of the film for round bales and between 55% and 65% for square bales.

To verify the rate of pre-stretching, draw two vertical lines on the spool before stretching, at a distance of 10 cm.

Once the film is stretched on the bale, the distance between these two lines must not be less than 16 cm and not more than 17 cm for a round bale; and not less than 15.5 cm and not more than 16.5 cm for a square bale.

Moreover, ensure that the width of the film after stretching remains higher than 75% of the standard width of the film before stretching (for example, a film which is 750 mm wide will be between 565 mm and 625 mm wide after stretching).

7.5 Wrapping operation

The principle of wrapping consists of applying, by double rotation of the bale and/or of the spools on two perpendicular axes, at least 6 layers of films at all points of the bale, as recommended by the EN 14932 standard, in order to ensure the best possible air-tightness and to limit the risks of perforation as much as possible.

It is specified that:

- for woody fodder such as alfalfa, the minimum number of layers must be 8.
- for continuous wrapping operations, 2 additional layers must be applied at the joint between bales,
- if, during the wrapping, the string, net or blades of grass are trapped between the first two layers of the film, it is necessary to add two more layers on the bale in which this has happened till a completely sealed bale is created.

Irrespective of whether they are individual round or square bales, the wrapping machine is adjusted depending on the dimensions of the bale (particularly the height of the spool holder).

The layers of film must overlap at least 50%.

It must be noted that films which are 750 mm wide offer superior coverage than 500 mm wide films, and thus improve the air-tightness of the bale, and result in better preservation of the fodder.

When they are used on the field, the rolls must be stored away from the sun and heat. This is even truer for wrapping films in dark colours, and particularly black films. If the rolls of the wrapping films get heated, it may create problems when they are installed.

During the wrapping, regularly check:

- the condition of cleanliness of the pre-stretching rolls and clean if necessary;
- the rate of pre-stretching. If the rate of the pre-stretching does not comply with the values specified in § 7.4, the work must be stopped and the wrapping machine must be adjusted.

The pre-stretching is an important stage. Insufficient stretching affects the proper adherence of the layers of films between themselves and results in a risk of air entering the bale (the preservation is affected). Excessive stretching results in excessive reduction of the thickness and width of the film. It no longer performs at the optimum level and there is a risk of it tearing. You must not forget that grass is still "alive" after it is cut. The cells continue to breathe in the presence of oxygen and consume sugar. The food value of the fodder reduces correspondingly.

It is thus very important to quickly complete the wrapping after baling (maximum 2 hours). The wrapping must not be done in rainy conditions (moisture reduces the adherence of the films) or during the hot periods of the day (heat affects pre-stretching).

The adhesive surface of the film must imperatively be in contact with the fodder.

If your wrapping machine uses two rolls of film, it is important to use the same colour of film (otherwise the temperature of the fodder wrapped in the bale is not homogeneous).

Do not leave a partially used roll on the unwinding boom when the work is stopped; replace it in its original packaging and store away from light. The heat accumulated by the un-protected roll risks causing problems in restarting the process (sticking, stretching, etc.) which is even more marked in dark coloured films.

7.6 Handling and storage of wrapped bales and continuous wrapping

It is important to limit handling as much as possible: during movements, avoid friction and impacts.

Every instance of handling is a potential chance for air to enter the bale and thus there is a risk of deterioration of the food quality of the fodder.

It is imperative to use specially designed tongs or tools to handle the bales and to check whether they are calibrated and maintained to ensure that they do not damage the bales.

All handling actions must be done within the hour that follows the wrapping, or after 72 hours. An intervention between 1 hour and 72 hours may affect the air-tightness of the layers of film, owing to the increase in pressure inside the bale, and could thus deteriorate the preservation of the fodder.

Round bales should preferably be stored on one of the flat surfaces ("upright bales") and should be stacked with a maximum of three bales in case of bales with a high content of dry material (between 45% and 55%), and maximum of two bales for bales with low content of dry material (between 35% and 45%).

For continuous wrapping in the shape of a sausage, the bales must be arranged on a flat horizontal surface. Non-compliance with this instruction shall result in the stretching of the film owing to the sliding of the bales during storing. This stretching may cause the wrapping film to lose its characteristics of impermeability to oxygen and water, which in turn results in the degradation in the quality of the fodder, or even complete loss.

It is recommended to store the bales near the place of intervention, on a specially prepared surface (preferably cement). Do not store bales on pallets. In any event, irrespective of the surfaces, the bales must not be stored on a surface where there is a chance of water accumulating (hole, stream of water, ditch or drainage). If the film is drenched in water, it may lose its characteristics of impermeability to oxygen and water, which in turn results in the degradation in the quality of the fodder, or even complete loss.

The film may be damaged by animals (refer to § 3.4.4), and since animals naturally gravitate towards trees for shelter, it is not recommended to store the bales near trees.

7.7 Consumption of wrapping bales

Our film is resistant to UV damage for 12 months (refer to § 3.3). It is thus imperative to consume the bales within 12 months following their wrapping operation.

7.8 Protection against animals

For protection against animals and risks of damage to the wrapping bales by animals, refer to § 3.4.4.

8 MEASURES TO BE TAKEN AFTER USING THE FILM

At the end of its life, i.e. at the end of their service life, the films mentioned in this document must be disposed of in compliance with the regulations and/or recommendations applicable in the country of use.

These films must never be buried or burnt by the user, nor should they remain stored on an agricultural site.

The films contain components which, after they degrade, may be harmful to the environment, particularly to water, the ground and the air.

In the absence of applicable regulations and/or recommendations, it is mandatory, either to bring these films to a company specialised in recycling or to ensure they are collected by the latter.

In order to facilitate the recycling and subject to the applicable regulations and/or recommendations, it is recommended to:

- remove the films in dry weather;
- remove any foreign object from the film (wood, stone, etc.);
- not mix films made of different materials, because these materials are not always compatible with the recovery of materials;
- not mix coloured films (black, green, white, brown, etc.) with transparent or translucent films;
- not mix thin films with thick films;
- not drag the films along the ground;
- before recovery by the collection company, the films must be placed in an area protected from bad weather.

9 CLIENT COMPLAINTS

9.1 Principle of responsibility

The obligations of our Company stipulated in this document are not performance-related, but rather constitute an obligation of means.

A wrapping film is considered compliant if it complies with the conditions stated in Article 3.

If such is not the case, our Company may be held liable, unless:

- the seller and/or purchaser failed to comply with the provisions stated in this document and this non-compliance is proven to be the cause of the complaint,
- the complaint results from an event not attributable to our Company.

9.2 Declaration of dispute

9.2.1 Admissibility of the declaration

Our Company can be held liable only under the conditions stated in Article 9.1. and if the percentage of bales concerned by the complaint is higher than 5% of all the stored bales.

9.2.2 Actions to be taken

In cases where the user of the "wrapping film" considers the film to be defective, he must:

- Immediately inform the supplier, and send copies to our Company for informational purposes, and communicate the following information therein:
 - manufacturing batch number of the film considered defective and the roll numbers,
 - copy of the labels of the film roll considered defective,
 - copy of the delivery notes and the invoices of the films considered defective,
 - date and place of use of the film considered defective,
 - nature of the wrapped fodder,
 - number of bales with defects for which the complaint is lodged,
 - total number of bales made for the site in question,
 - a description of the defective nature, by sending a sample from at least one complete bale envelope and photographs showing the bale(s) in question.
- Immediately take protective and compensatory measures which are necessary to ensure the continued correct preservation of the fodder.

- Allow his supplier and/or our Company to enter his place of operations and carry out investigations (for example, taking samples) which are necessary for the inquiry into the complaint. At the end of its inquiry, our Company shall inform the supplier about its decision regarding the client's complaint.

In case of a hidden defect or non-compliance in the delivered goods and/or damage (material, immaterial, direct or indirect, consecutive or otherwise) caused by the "wrapping film", the liability of our Company shall be limited, depending on its choice, to either reimbursing the cost of the defective film or replacing the said film.

10 EFFECTIVE DATE

This document replaces all previous documents, concerning the same films from its effective date. This document may undergo modifications; **only the document in force on the date of the agreement is applicable.**

The document in force shall be sent to you along with every agreement.

11 APPLICABLE LANGUAGE

Since this document is drafted in several languages, the English version shall prevail in the event of disagreements regarding its translation.