

**GENERAL PRODUCT  
SPECIFICATIONS FOR STEEL  
CORDS TO BE APPLIED BY  
THE SUPPLIER  
CDC\_MATTFR\_011**



## SUBJECT

This document is providing technical information for external suppliers related to the delivery of metal cords to MICHELIN sites.

<b>Cancel and replace</b>	CDC_MATTRF_011 ENG V1.2
<b>Modification</b>	Precisions on sampling, transport, winding directions, humidity in packaging, and traceability. Suppression of Type I packaging. Change of control laboratory for Europe.
<b>Application Date</b>	June 1 <sup>st</sup> 2017

## SCOPE

This generic specification applies to the purchasing of metal cords for tire reinforcement (steel cords). It is applicable for all regions in the world.

It describes the necessary technical conditions for supplying the product. It doesn't integrate the technical characteristics of each product, which are subject to other individual specifications which are given to the supplier for validation for each product approval.

Any specificity agreed upon by a supplier and a Michelin site must be laid out in an amendment drawn up by the local supplier relations contact.

# Sommaire

<b>1 – APPROVAL</b>	<b>4</b>
<b>2 – GENERAL TERMS OF DELIVERY</b>	<b>4</b>
2.1 – Delivery unit	4
2.2 – Lot ou batch	4
2.3 – Delivery date	4
2.4 – Loading and transport	4
<b>3 – CONDITIONING AND PACKAGING</b>	<b>5</b>
3.1 – Type of spools	5
3.2 – Filling of boxes and storage	6
3.3 – Types of packaging	7
3.3.1– Summary of packaging types and shelf-life	7
3.3.2– Packaging type II :	8
3.3.3– Packaging type III :	9
3.4 – Return of spools and packaging material	10
<b>4 – IDENTIFICATION</b>	<b>10</b>
4.1 – Identification of spools	10
4.2 – Identification of content (pallet; box...)	10
<b>5 – DELIVERY NOTE</b>	<b>11</b>
<b>6 – CERTIFICATE OF ANALYSIS (COA)</b>	<b>11</b>
<b>7 – SAMPLES FOR ANALYSIS</b>	<b>11</b>
7.1 – Identification of Samples	11
7.2 – Conditioning of samples	12
7.3 – Shipping of samples and COA	12
7.4 – List of laboratory	12
<b>8 – EMISSION OF CLAIM</b>	<b>13</b>
<b>9 – DOCUMENTS OF REFERENCE</b>	<b>13</b>

## 1. APPROVAL

Approval is granted for a product manufactured on a given production site using a clearly defined process.

**No modification on material and/or on cord manufacturing process or cord elements can be made without prior information to Michelin, who will decide if this modification requires a new approval (see INS\_MATTRF\_021). The supplier has to write all the modifications in his process change book and/or update his quality plan.**

## 2. GENERAL TERMS OF DELIVERY

### 2.1 – Delivery unit

The delivery unit is the quantity of product delivered by the same means of transport (for example a truck or a container).

### 2.2 – Lot or batch

The lot or batch is the number of individual items with the same reference (AS primary code), which is considered a homogeneous production unit (e.g. a production batch). The definition of such a unit should be obtained according to the supplier process FMEA, and be shared and approved with Michelin.

Individual item = steel cord spool

One lot or batch can be delivered in one or more delivery units, in one or more Michelin use plants.

### 2.3 – Delivery date

The delivery means “products provided to the place foreseen by the commercial agreement”.

### 2.4 – Loading and transport

Loading plans and blocking devices must be designed to prevent impact between the boxes or shift of boxes during transportation. The supplier will ensure that the means of transport is in good condition so that effective protection is provided against external pollution (including moisture) and rust.

The supplier is responsible of protection (preservation) of the product delivered. He has to implement appropriate actions for handling, packaging, storage and delivery of the product.

Spools and packaging types described in this chapter have to meet following requirements:

- Protect the surface condition (pollution, oxidation ...),
- Protect against external threat (workshop air, humidity, dust, projection...).

No element out of wood, such as pallet or reinforcement for packing, etc, is accepted in our sites of manufacture.

### 3.1 – Type of spools

To preserve a good surface condition of the delivered products, the supplier has to use the appropriate conditions for spools maintenance and cleanliness. The supplier has to remove the old identification tags.

Different types of spools can be used in MICHELIN plants: For example

- Spools PK supplied by Michelin.
- Spools B40/B60.
- Spools B80/33 – B80/17

The type of spools and packaging are indicated in each purchase order.

#### **Fixing of cord-end on the spools:**





Concerning PK spools, supplied by Michelin, the fixing of the cord on the spool core is made by crossing the assembly.

The fixing of the cord-end of the spool is made by using a non-sulfide rubber band which doesn't damage the adhesion properties of the assembly.

Concerning metal spools (B40, B60 and B80/F80), fixing is made by inserting the end of the cord in one of the holes of the spool-core. The end of the cord is slipped under the clamp (clip, staple) located on the flange of the spool. The spool is always positioned in the packaging so that you can see the end of the cord when opening the box.

R or L spools are defined according to the unwinding direction specified in the order for Europe, South America and Asia, or winding direction for North America. The arrow written on the spool corresponds to the unwinding direction.

For Europe, South America and Asia:

Classifi.	Spool position in box	Pay-Off Direction	Mark
R	< The Upper Side >  (B40)                      (B80)                      (B60 / F80)	Clockwise 	"R" or "UP"
L	< The Upper Side >  (B40/B80)                      (B60/F80)	Count-clockwise 	"L" or "DOWN"

AH and HO spools are defined according to the unwinding direction specified in the order. AH means anti-clockwise unwinding and HO means clockwise unwinding.

### 3.2 – Filling of boxes and storage

In order to protect the adhesion properties of the product, from manufacturing to packaging, the supplier has to set actions for reducing the time needed, taking into account temperature and humidity conditions of the storage area. The supplier shall take appropriate actions to prevent the condensation on products due to the change of temperatures.

A relative humidity below 60% for a temperature lower than 35°C is indicated for the storage of the products before packaging in order to avoid creating a humid environment in the packaging.

For avoiding reduction of shelf-life of the products, above mentioned conditions are strongly recommended.

Note: the useful life is the deadline of keeping (storing before usage) the product. So, the number of days between the manufacturing of the oldest spools in the packaging and its use on the calander. This useful lifetime depends on the kind of packaging, materials used and the environmental conditions during packaging.

Each reused packaging element must be in clean condition: Old product labels, holes and tears in boxes, polyethylene covers or films, dirt, and any kind of pollution generally speaking are not acceptable.

The supplier notes the production-date of the oldest spool and records it on the identification label of the packaging.

Products should be stored in sealed packaging in a warehouse insuring effective protection is provided against external pollution (including moisture) and rust.

### 3.3 – Types of packaging

The supplier is responsible for choosing the material, shape and type of the packaging, for safely shipping and handling the products and for maintaining the products' characteristics. Any changes to the packaging material must be explained by the supplier with regard to product preservation over time and must be recorded in the variation log.

All types of packaging must guarantee relative humidity strictly inferior to 60%, whatever the temperature fluctuations encountered during transportation.

A humidity indicator must be present in packing to guarantee this specification. It is recommended that they show humidity up to 60% in order to avoid any doubt on the conformity of humidity inside the pallet.

The shelf lives for each type of packaging, described below, are only for indication. They are not contractual because they depend on temperature and humidity conditions during the manufacturing, storage as well as packaging materials used and condition of boxes upon arrival at the customer.

When VMI or VMOI is in place, the supplier has to adapt the quantity of product in the warehouse to avoid any product out of ageing, following the min and max defined. Otherwise, the products must be delivered before aging reaches half of their length preservation for products coming from the same continent or the two-thirds for products coming from another one.

#### 3.3.1– Summary of packaging types and shelf-life

The following table summarizes the packaging components.

<i>COMPONENTS</i>	<b>Packaging types</b>	
	<b>II</b>	<b>III</b>
Spools PK		<b>YES</b>
Spools B40 or B60 or B80	<b>YES</b>	<b>YES</b>
Polyethylene film	<b>YES</b>	
Welded polyethylene inside cover with recommended partial vacuum		<b>YES</b>
Cardboard box (top, sleeve, bottom)		<b>YES</b>
Bottom and top	<b>YES</b>	
Pallet (metal or synthetic)	<b>YES</b>	<b>YES</b>
Dividers with pins or centering prints	<b>YES</b>	<b>YES</b>
Centering bottom and top protection		<b>YES</b>
Desiccant bags and humidity indicator	<b>YES</b>	<b>YES</b>
Banding straps	<b>YES</b>	<b>YES</b>
<b>LIMITS OF USE (days)</b>	<b>90</b>	<b>180</b>

The humidity indicator should be visible before opening the plastic protection of the pallet (film or cover). The quantity of dessicant bags should be determined by the supplier according to

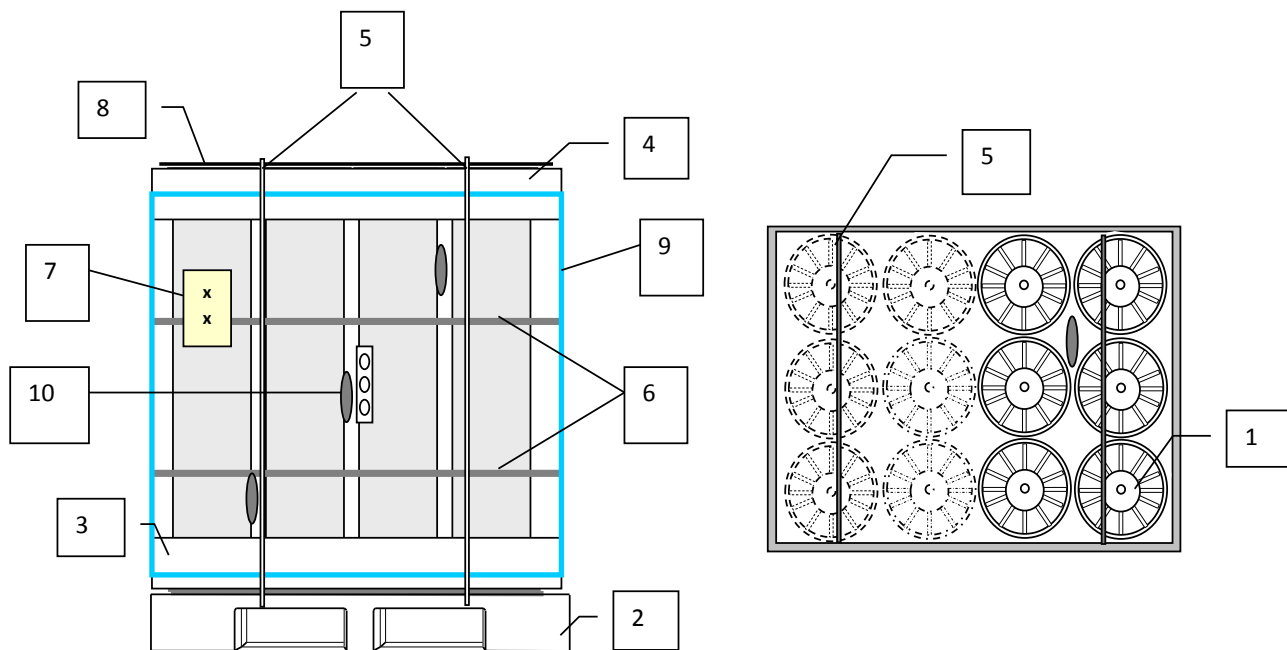
permeability of their plastic protection to ensure a maximum level of relative humidity of 60% inside the pallet.

The packaging type III must be able to be stacked on at least 2 levels in our warehouses..

### 3.3.2– Packaging type II ::

<b>Subject</b>	Pallet for 36 B80 or F80 spools
<b>Shelf life</b>	90 days
<b>Use</b>	Continental Transport: < 3 days.

Index	Component	Index	Component
1	Spool	6	Centering bottom/ dividers (interlayers)
2	Pallet (wooden pallets are forbidden)	7	Pallet identifier on the film, at the level of the top left spool, of each long side of the pallet
3	Bottom	8	Protective layer / Angle-piece (if needed to protect the cardboard)
4	Top-cover	9	Stretch film, with a sufficient number of turns, taking into account the elongation of the film; must guaranty a relative humidity strictly inferior to 60% inside the packaging. It is important to get a good resistance of the stretch film at the bottom and top of the pallet to provide tightness  Or polyethylene cover
5	Banding straps	10	Minimum 3.1 kg of desiccant bags for 36 spools + humidity indicator.

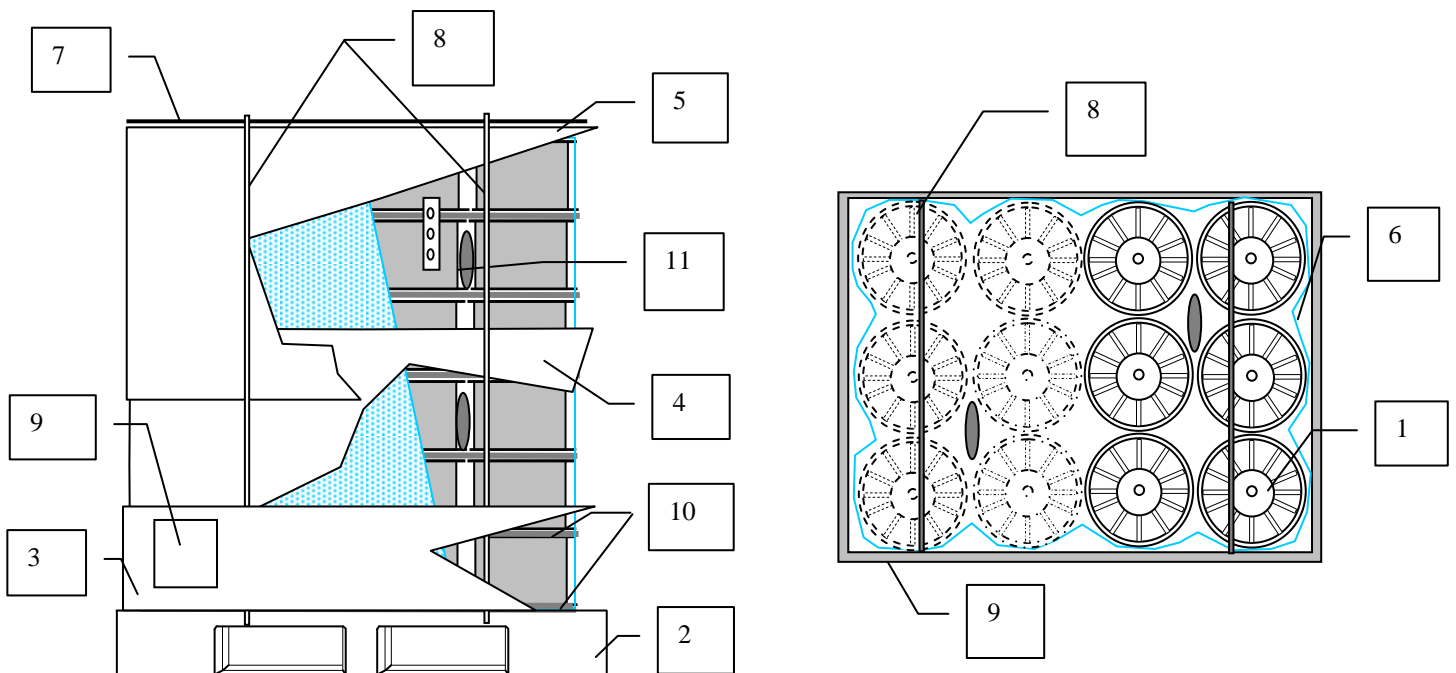




### 3.3.3– Packaging type III :

<b>Subject</b>	<b>Cardboard box for 72 spools PK – B40 – B60 – or 36 B80 or F80 spools</b>
<b>Shelf life</b>	<b>180 days</b>
<b>Use</b>	<b>Intercontinental Transport : &gt; 3days, sea cross, loading and unloading</b>

Index	Component	Index	Component
1	Spool	6	Welded polyethylene bag with partial vacuum recommended
2	Pallet (wood is forbidden)	7	Protective cap / Angle (if needed to protect the cardboard from the straps)
3	Bottom box	8	Banding straps
4	Sleeve of box	9	Identifier on each long side
5	Top box	10	Centering bottom/Dividers
		11	Minimum 3.1 kg of desiccant bags for 36 B80 or 72 B40/ 60 spools + humidity indicator.



### 3.4 – Return of spools and packaging material

The spools and packaging components will be returned to the supplier in good conditions for reuse. The packaging components will be returned after categorization.

For the type II packaging, the supplier delivers the necessary cardboard boxes to place the spools.

The removal of identification labels is within the responsibility of the supplier.

## 4. IDENTIFICATION

### 4.1 – Identification of spools

A sticker will be put on each spool, on the flange which corresponds to the fixing of the cord; the spool has to be put in to the box so that label and the fixed cord-end can be seen on top. Old stickers must be removed without residuals of glue from old labels.

Each label contains the following information:

- Unique identifier to ensure traceability by the supplier
- The name of the cord (secondary code of the cord, supplied by Michelin), for example: 4.26NF85. Another designation like 4.26-RT or standard construction name (for example: 2+2x0,26 HT) is tolerated.
- The Michelin primary code beginning by AS xxxxx (primary code of the cord, supplied by Michelin, can be found on technical specification).
- The place of manufacturing or supplier's name.
- The date of manufacturing or lot number.
- The number of welds (if required in the specifications of the product).

### 4.2 – Identification of content (pallet; box...)

Each box will have 2 labels on the 2 opposite sides. Each label shows:

- Name of the supplier.
- Place of manufacturing.
- Number of spools, orientation and length
- The construction of the cable followed by the type of spool; for example: 2+2x26HT/B80.
- The Michelin primary code beginning by AS for example AS 50346.
- The lot number.
- The net weight and the gross weight.
- Date of manufacturing of the oldest spool of the box (and not the day the COA is produced).
- The bar code if required, in compliance with the specifications sent to the supplier

Labels must resist to transport and handling.

## 5. PACKING LIST

Each delivery will arrive with a packing list including:

- Purchase order number of Michelin.
- Name of supplier and factory
- The construction of the cable followed by the type of spool; for example: 2+2x26HT/B80.
- The Michelin code beginning by AS (primary code of the assembly, supplied by Michelin); for example AS 50346.
- The delivered quantity (number of spools, number of pallets, weight)
- Manufacturing date of the lot (date of production of the oldest spool in the lot).
- Number of boxes.
- Lot number(s).

## 6. CERTIFICATE OF ANALYSIS (COA)

Each delivery unit is accompanied by an analysis certificate, in compliance with the "Reference for writing Certificates of Analysis (COA) or certificates of compliance," referenced in chapter 9. In case of delivering products from more than one lot in one delivery unit, there should be as many COAs as lots delivered.

The supplier is responsible for defining its own sampling plan and verifications in order to guarantee that the product delivered complies with the specifications.

The sampling plan, verifications performed, and results will be sent to Michelin upon request.

## 7. SAMPLES FOR ANALYSIS

The samples must be representative of the lot delivered.

Each sample must be taken out of a different spool and be composed of at least:

- 15 meters for cords consisting of 2 filaments,
- 12 meters for cords consisting of 3 or 4 filaments,
- 8 meters for cords with more than 4 filaments

The supplier will send to the Michelin laboratories designated below the samples. The number of samples per lot depends on Michelin's level of trust with regard to complaints and the Cpk of each characteristic, with a minimum of 12 samples and a maximum of 25 samples per lot.

### 7.1 – Identification of Samples

The label of each sample shall indicate:

- The construction of the cable; for example: 2+2x26HT.
- The Michelin code beginning by AS (primary code of the assembly, supplied by Michelin); for example AS 50346.
- Lot number.
- Manufacturing date.
- The spool number.
- The manufacturing plant.

The destination site(s) of the lot shall be indicated on the package containing all the samples.

## 7.2 – Conditioning of samples

It is the responsibility of the supplier to ensure the preservation of the samples by implementing the appropriate conditions for handling, packaging, storage and delivery of the samples.

However, the following actions are recommended: The samples will be in a hermetically closed polyethylene bag with desiccant bags, and will be put in an envelope to protect from light. A particular attention should be paid on the protection of the surface of the samples for avoiding any kind of contact.

## 7.3 – Shipping of samples and COA

For each lot delivered, the supplier must send:

- The COA to the factory of destination, (to be included in each delivery unit containing said lot),
- The COA and samples for laboratory analysis to the address as reported below.

Samples must be delivered to the laboratory 72 hours before the product delivery

## 7.4 – List of laboratory

### Europe:

Michelin Romania S.A.-punct de lucru Zalau Cord  
Strada Lupului, Nr. 43, Loc. Zalau  
Cod postal 450166, Jud. Salaj  
ROMANIA

ATT : Animateur Système Qualite

### North America:

Michelin Tire Corporation  
6301 Hwy 76  
Pendleton, S.C. 29670

Atten: Technician in charge of control reception

### South America:

Sociedade Michelin de Participações, Indústria a Comércio Ltda.  
Unidade Itatiaia - Fábrica CPR/UAS  
Rodovia Presidente Dutra, Km 316  
Itatiaia - RJ - Caixa Postal 81.853  
CEP: 27.580-00 - Brasil

### Asia:

Michelin Asia plants do the reception control by themselves, the samples will be received as well as the product. The sample shipment address is same as the plant address.

## 8. EMISSION OF COMPLAINT

In the event of a product non-compliance detected during reception laboratory verification (by applying the statistical rules laid out in the NFX 06-023 standard) or use, a complaint or notification will be sent to the supplier.

A complaint or notification on the COA may be sent if it is missing, incomplete or does not correspond to the delivery.

The complaints must be handled according to the document of reference “Michelin Purchasing Principles”.

## 9. DOCUMENTS OF REFERENCE

The reference documents are available on Internet:

<http://purchasing.michelin.com/Espace-documents>

Title	Reference documents
Michelin Purchasing Principles	
Referential for writing the certificate of analysis (COA) or the certificate of compliance	Certificate of analysis “COA”
Changes to external suppliers' steel cord manufacturing processes	INS_MATTRF_021