

# GENERIC BRONZE BEAD WIRE SPECIFICATIONS FOR SUPPLIERS



## OBJET

This document is provided to external suppliers and concerns the technical elements required for delivery of bead wire to MICHELIN plants

<b>Supersedes</b>	CDC_MATTRF_010 ENG V1.2
<b>Modification</b>	Adaptation of specification to 180 aging delay and reduction of scope to bronze bead wire specifically. Precisions on sampling, traceability. Change of control labs for Europe and India
<b>Application date</b>	June 1st 2017

## DOMAINE D'APPLICATION

These specifications apply to bronze bead wire purchased for tire reinforcement. They apply to all geographical regions around the world. They describe the technical conditions required for supplying products. They do not cover the specific technical characteristics of each product, which are laid out in individual specifications provided to the supplier with each product agreement. 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..

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## 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 wire manufacturing process or wire elements can be made without prior information to Michelin, who will decide if this modification requires a new approval (see INS\_MATTRF\_020). The supplier has to write all the modifications in his process change book and/or update his quality plan.**

## 2. GENERAL CONDITIONS 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 ou batch

The lot or batch is the number of individual items with the same reference (FT 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 = bead wire bobbin

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

### 2.3 – Delivery

Delivery means "merchandise provided on the site defined in the sales agreement."

### 2.4 – Loading and shipping

Loading plans and wedges prevent the bobbins from striking each other or moving 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.

## 3. PACKAGING

The supplier is responsible for ensuring that the product is delivered in good condition by using appropriate handling, packaging, storage and delivery techniques.

The bobbins, coils and types of packaging described in this chapter meet the following conditions:

- Preserve surface condition (pollution, rust, etc.),
- Protect from the surrounding environment (workshop atmosphere, humidity, dust, projection, etc.).

Wooden packaging elements, such as pallets and reinforcements, are not accepted on our sites.

### **3.1 – Types of bobbins and coils**

The supplier must properly maintain and clean the bobbins in order to preserve the surface condition of the delivered product. The supplier is responsible for removing old id labels.

Different types of bobbins may be used on MICHELIN sites:

- BS900, A20, D53, ... bobbins, depending on the needs defined by the geographical zones,
- C1000/reelless coils.

The supplier should deliver the wire on bobbins, by default, unless the word "reelless coil" appears on the order.

### **3.2 – Filling and storing containers**

In case welds are not allowed in the technical specification, delivery of incomplete bobbins may be tolerated, but only upon approval by the recipient site or geographical zone, and only in pre-defined amounts.

The supplier must maintain the product's adhesive properties between manufacturing and packaging, taking into account the heat and humidity in the packing area, and by taking all necessary measures to prevent drops in temperature which could cause condensation on the products.

Relative humidity of less than 60% and a temperature of less than 35°C, preferably relative humidity of less than 30% and temperature between 17°C and 35°C, are recommended for product storage before packing in order to avoid creating a humid environment in the packaging.

Note: The usage deadline refers to the deadline for product storage, i.e. the number of days between manufacturing the oldest bobbin in the package and its use in beads. It depends on the type of packaging, the materials used and the conditions under which the product is packaged.

All packing and handling elements which are reused must be clean: Old product labels, holes and tears in boxes, polyethylene covers or films, dirt, pollution and chipped paint on the bobbins are not acceptable.

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%.

A humidity indicator must be included in the packaging to guarantee that this requirement is met.

The shelf lives laid out below for each type of packaging are given for information only. They are not contractual because they depend on the temperature and humidity when the bead wire is placed on the bobbin and during storage, the packaging materials used and their condition upon delivery.

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 two-thirds for products coming from another one.

### 3.3.1– Bobbin packaging and shelf life

The table below lists components by type of packaging; components are marked YES if they are required. The configuration required for each type of packaging is MICHELIN’s recommendation for the guaranty of shelf life maintain for the products.

It is the sole responsibility of the supplier to adapt this recommendation according to its knowledge of transportation conditions and materials, in order to guaranty the quality of packaging upon arrival in MICHELIN plants, meaning the integrity of polyethylene film (including no tears on the flanges) upon arrival, as well as a relative humidity strictly below 60% in the packaging.

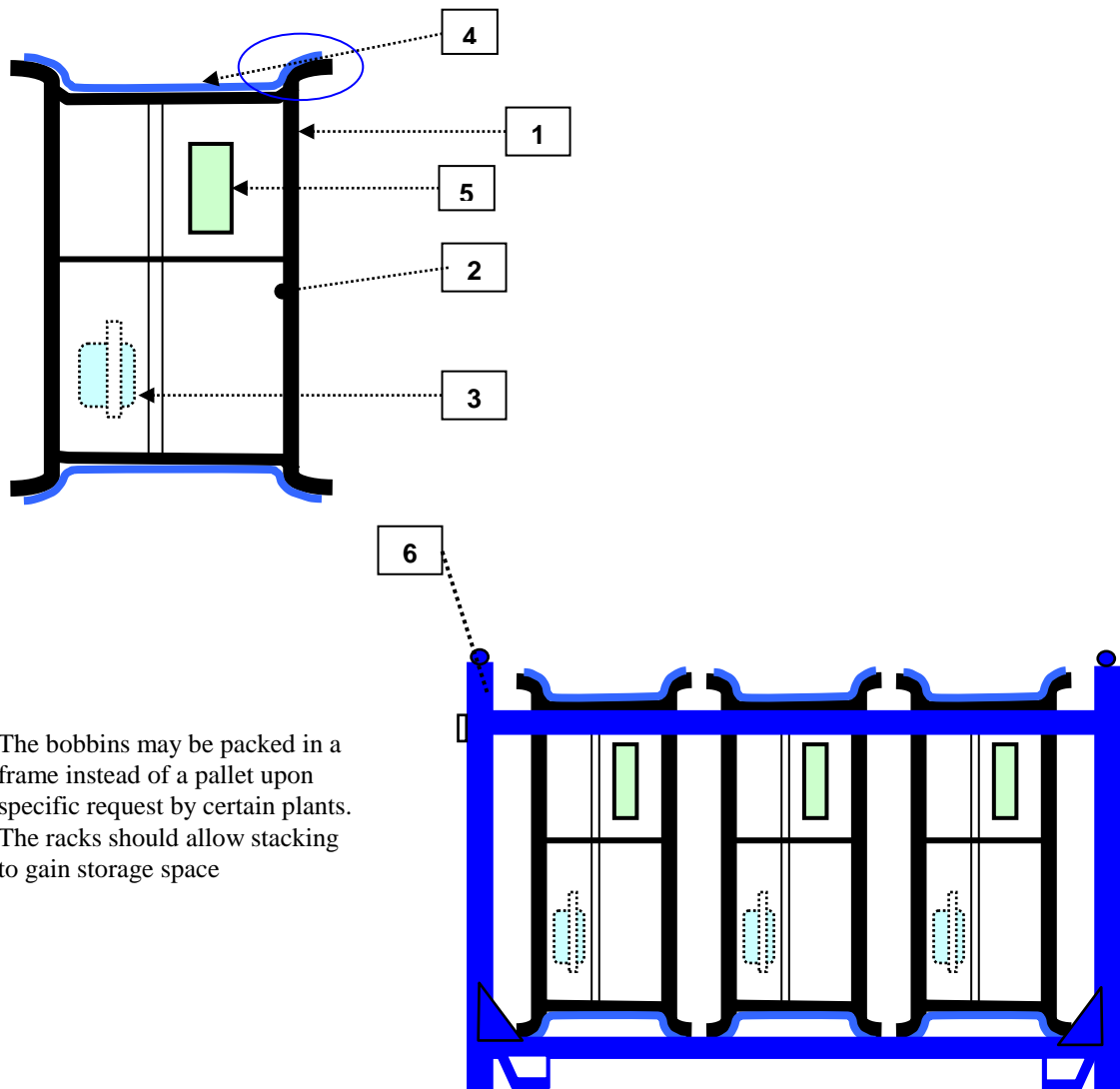
The packaging must also guaranty a relative humidity level strictly below 60% during the whole shelf life of the product, during transportation as well as during storage in a warehouse insuring effective protection is provided against external pollution and rust.

N°	COMPONENTS	TYPE	
		II	III
1	<b>Metallic Bobbin</b>	<b>YES</b>	<b>YES</b>
2	Protective paper	<b>YES</b>	<b>YES</b>
3	Dessicating packets ( <i>new packets recommended</i> )	<b>YES</b>	<b>YES</b>
4	Humidity indicator	<b>YES</b>	<b>YES</b>
5	Polyethylene film	<b>YES</b>	<b>YES</b>
6	Metallic/plastic pallet or rack for <b>3 bobbins</b>	<b>YES</b>	<b>YES</b>
7	Reinforcement of PE film on flanges		<b>YES</b>
8	Protective parts fixed on pallet to avoid degradation of polyethylene film on flanges		<b>YES</b>
9	Straps for spool rotation prevention		<b>YES</b>

### 3.3.2– Type II packaging

<b>Purpose</b>	Normal packaging for bobbins
<b>Shelf life</b>	<b>90 days</b>
<b>Type</b>	Continental transportation: 24 hours to 3 days

Index	Element	Index	Element
1	Metallic bobbin	4	Enough layers of plastic film to ensure water tightness and relative humidity level strictly below 60% during the whole shelf life of product, must cover the flanges, may be reinforced to prevent tears by the flanges.
2	Protective paper > 1 layer of coverage, held in place by an adhesive.	5	ID label (may be placed under plastic film as long as the information can be read through the film).
3	200g of dessicant and a humidity indicator (40 to 60%at least) divided into 2 to 4 packets	6	Metallic pallet or rack containing 3 bobbins

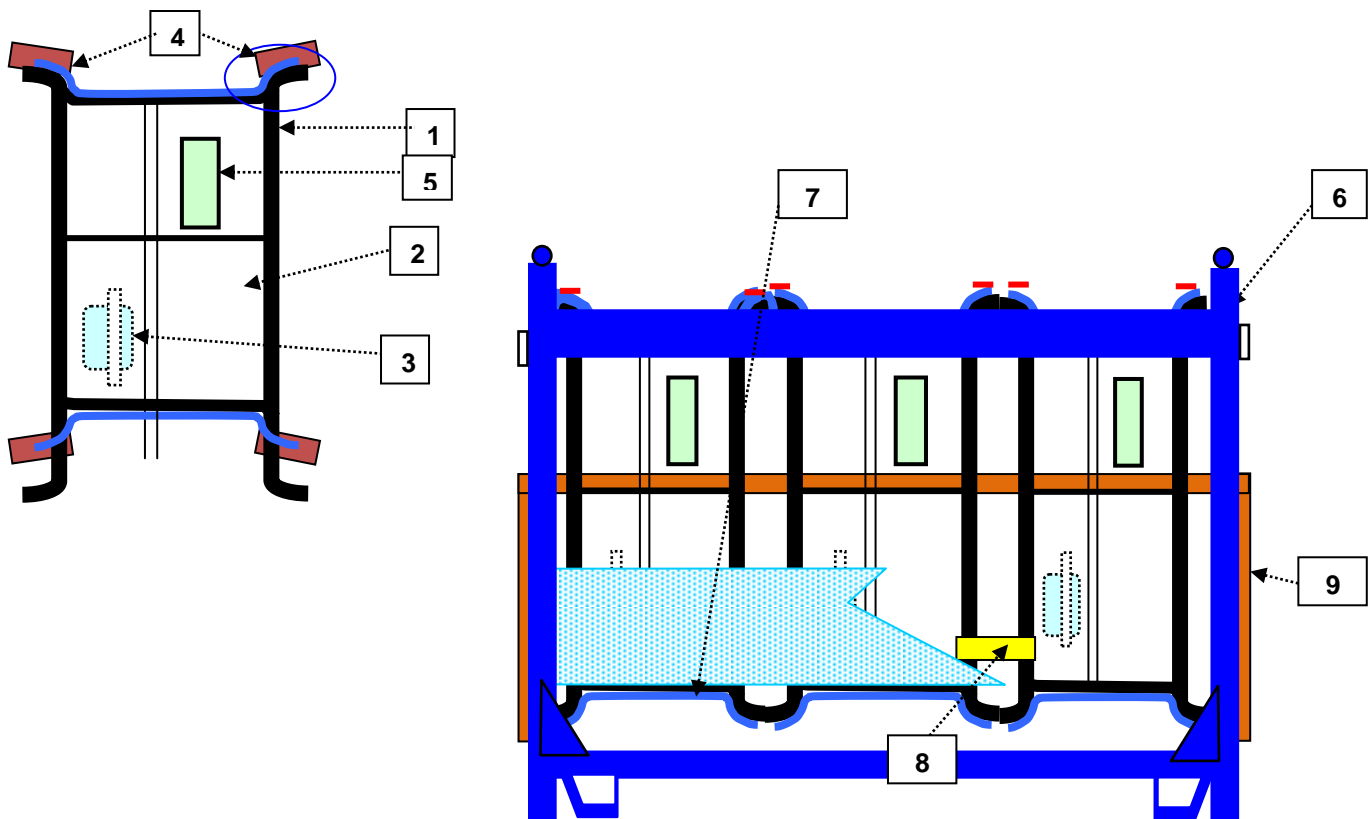


The bobbins may be packed in a frame instead of a pallet upon specific request by certain plants. The racks should allow stacking to gain storage space

### 3.3.3– Type III packaging

<b>Purpose</b>	Maritime packaging for bobbins.
<b>Use</b>	<b>180 days</b>
<b>Type</b>	<b>Continental or intercontinental transportation:</b> More than 3 days, maritime transport, loading and unloading

Index	Element	Index	Element
1	Metallic bobbin	5	ID label (may be placed under plastic film as long as the information can be read through the film).
2	Protective paper > 1 layer of coverage, held in place by an adhesive.	6	Metallic pallet or rack containing 3 bobbins
3	400g of dessicant and a humidity indicator (40 to 60% at least) divided into 2 to 8 packets	7	Potential plastic protection film between bobbins and metallic pallet or rack (not a bag), in case protection pad (8) does not guaranty protection of plastic film (4) on the flanges
4	Enough layers of plastic film to ensure water tightness and relative humidity level strictly below 60% during the whole shelf life of product, must cover the flanges, <b>must be reinforced</b> to prevent tears on the flanges.	8	Intermediate protection pad (foam or rubber) between metallic pallet or rack and bobbin to prevent flange degradation of bobbin plastic film (fixed on pallet or rack)
		9	Metal strap to prevent bobbin rotation in the rack or pallet (supplier has to choose position to guaranty stability)

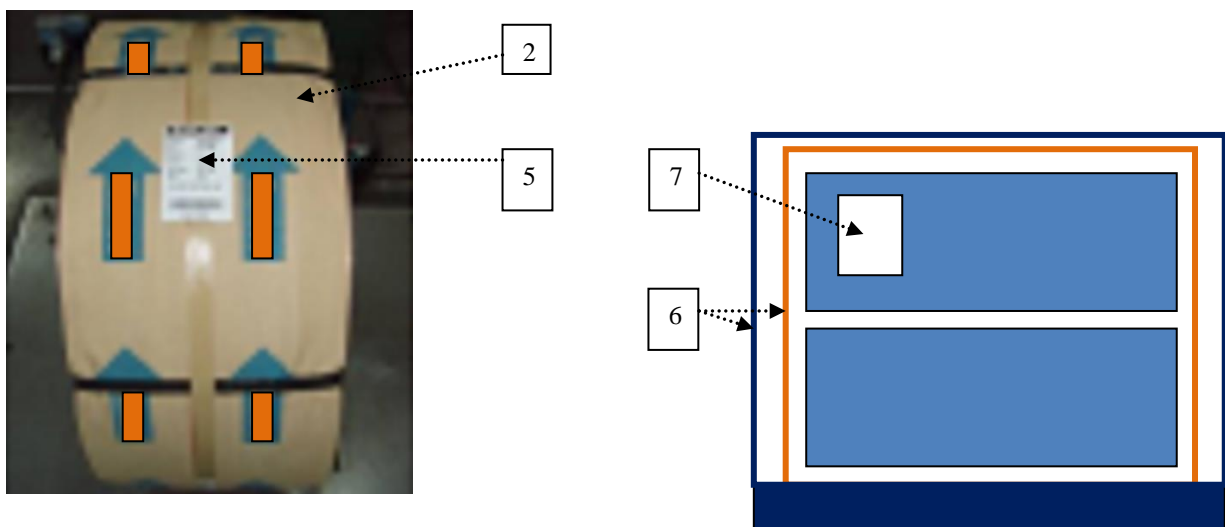
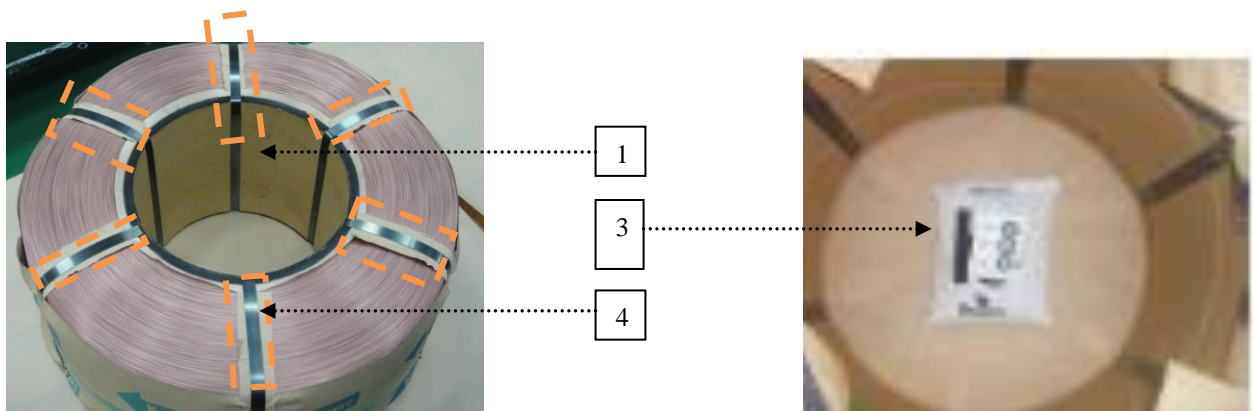




### 3.3.4– Coil packaging:

<b>Purpose</b>	Maritime packaging
<b>Use</b>	<b>180 days</b>
<b>Type</b>	<b>Continental or intercontinental transportation:</b> More than 3 days, maritime transport, loading and unloading

Index	Element	Index	Element
1	Cardboard cylinder	4	Metallic or plastic ties, protected to avoid marking the wire
2	Protective paper > 1 layer of coverage, held in place by an adhesive.	5	ID label on each reel
3	400g dessicant packets and humidity indicator	6	Final packaging to protect the product from humidity and pollution: plastic bag with partial vacuum + cardboard box
		7	ID label on box



## 4.1 – Bobbin or coil identification

In the case of metallic bobbins, a sticker will be placed on one flange of each bobbin and another one will be placed on the outside of the bobbin packaging. The stickers can be easily removed and will not leave traces on the bobbin.

NB: The supplier must remove all old labels.

In the case of coils, the label must be placed on the outside of the coil (see 3.3.4)

Each label should feature at least the following information:

- Unique identifier to ensure traceability by the supplier
- The Michelin primary code starting with FT, e.g. FT 43210.
- The type of bead wire (e.g. FT130HT)
- The manufacturing site
- The lot ID
- The date of manufacture of the bobbin
- The bar code if required, in compliance with the specifications sent to the supplier
- Bobbin/coil weight

## 4.2 – Pallet identification (valid for pallet, metal rack, box...)

If required by the customer, each pallet must have 2 labels placed on opposite sides. Each one must state:

- The name of the supplier
- The manufacturing site
- The Michelin purchase order number
- The type of bead wire (e.g. FT130HT)
- The Michelin primary code starting with FT, e.g. FT 43210.
- The lot ID
- The date of manufacture for the lot delivered (= manufacturing date of the oldest bobbin of the lot)
- The net weight of each of the three bobbins
- The bar code if required, in compliance with the specifications sent to the supplier

The labels must stand up to transportation and handling.

## 5 PACKING LIST

Each delivery must be accompanied by a packing list including:

- The Michelin purchase order number
- Name of the supplier and manufacturing plant
- The type of bead wire (e.g. FT130HT)
- The Michelin primary code starting with FT, e.g. FT 43210.
- The quantity delivered (number of bobbins, total weight and weight of each bobbin)
- The date of manufacture of the lot (= manufacturing date of the oldest bobbin of the lot)
- The number of boxes or pallets
- Lot number

In the case of consignment deposits (VMI or VMOI), the supplier must adapt stock levels to prevent products from expiring on the shelf.

## 6. ANALYSIS CERTIFICATE (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. In case not all bobbins are sampled, the samples must be taken randomly.

Each sample must be taken out of a different bobbin and be composed of at least 15 pieces of 40 to 60 cm in length.

The supplier will send to the Michelin laboratories designated below the samples. The number of samples depends on Michelin's level of trust with regard to complaints and the Cpk of each characteristic, with a minimum of 12 samples for all lots including 12 or more bobbins.

### 7.1 – Sample identification

The label of each sample must state:

- The type of bead wire (e.g. FT130HT)
- The Michelin primary code starting with FT, e.g. FT 43210.
- The lot number
- The bobbin number.

The lot's destination(s) must be marked on the package containing all the samples.

## 7.2 – Sample packaging

The supplier is responsible for ensuring that the sample is well preserved by using appropriate handling, packaging, storage, and delivery techniques.

The following measures are, however, recommended: Samples should be packed in a hermetically sealed polyethylene bag containing dessicant tablets (or equivalent) and inserted in an envelope which protects them from light. Special care should be taken to protect the surface of the samples (for adhesion tests) by avoiding all contact.

## 7.3 – Shipping for samples and COAs

For each lot delivered, the supplier must send:

- The COA to the recipient plant
- The COA and the samples to the appropriate laboratory; addresses are listed below.

The samples must be delivered to the laboratory at least 72 hours before the product is delivered.

## 7.4 – List of laboratories

### 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**  
**CPR//RS/GQA - Laboratório**  
**Rodovia Presidente Dutra, Km 316**  
**Itatiaia - RJ - Caixa Postal 81.853**  
**CEP: 27.580-00 - Brasil**

### Asia except India

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

**India:**

Building 2, No. 168 ShenNan Road, Minhang,  
Shanghai 201108, P.R. China  
Att: GST EM planner

**8. Complaints**

In the event of a product non-compliance detected during reception laboratory verification (by applying the statistical rules laid out in the NFX 060-023 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. REFERENCE DOCUMENTS**

The reference documents are available on Internet:

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

<b>Titre</b>	<b>Référence documentaire</b>
Michelin Purchasing Principles	
Referential for writing the Certificate of Analysis (COA) or the Certificate of Compliance	Certificate of analysis «COA»
Changes to external suppliers' bead wire manufacturing processes	INS_MATTRF_021