



## MESBAR KAVEH COMPANY

Mesbar Kaveh company is established in 2001 by private investment by Mr. Davood Rahmani in Kaveh industrial city on a 10,800 square meter ground located in Saveh province, aiming to develop and upbring electricity industry and optimal usage of country underground sources and improving copper and aluminum production industry to obtain more added value.

The main activities of this company are:

1. Supplying raw material of the country electricity industry
2. Investment in the electricity industry development
3. Production of copper and aluminum and their alloys semi-manufactured products

By employing managerial experiences and expert's proficiencies together with using world's most advanced machinery and technology from Finland, Germany, England, Italy, Spain, Taiwan, China and... she has managed to present high quality products in accordance with world standards to civil and foreign markets of wire and cable, transformer, electricity post, distribution panel and other related industries.

### **Outlook:**

Developing copper and aluminum industry prospecting economical independency, ranking as the fifth superior company in The Middle East

### **Mission:**

Supplying the raw materials of electricity industries and developing copper and aluminum semi-manufactured products in the country by benefiting from specialists and experts and using the cutting edge technology to create more added value for the stockholders and the employees.

**Target:**

1. Fulfilling the commodity basket of the raw material of copper and aluminum products of electricity industry
2. Accomplishing the copper production circuit from the mine to the semi-manufactured products
3. Developing export by promoting the quality and diminishing the full-price
4. Extending loyal customers
5. Increasing and promoting employees' training as the main assets of the company

**Values:**

- Attempt to create a safe and serene environment for commercial and economical activities.
- Attempt to protect the living environment by spoiling green technologies.
- Managing according to ethics and commercial values

**Strategies:**

Aim to becoming a known brand in The Middle East

INTRODUCTION





## FACTORIES

### Rod factory

**Specifications:** This factory has been founded on a 2,000 m<sup>2</sup> ground in Kaveh industrial city of Saveh province. The machinery and the equipment are from Finland.



#### Production process:

- **Entry:** Cathode grade A is the raw material obtained from National Iranian Copper Industries Co.
- **Process:** Upcast Casting (Made in Finland)  
The most advanced method of wire production by Upcast technology is used in Process. In this method wire is moulded vertically in sizes 8-25 mm in 3.5 ton coils.

### Copper sections factory

**Specifications:** This factory has been founded on a 2,500 m<sup>2</sup> ground in Kaveh industrial city of Saveh province and the machinery and the equipment are from England, Italy, China and Iran.



● **Entry:** The raw material is obtained from wire factory in varied dimensions.

● **Phase 1:** Conform (Made in England)

First the copper or aluminum wires are heated up to 650 C° by friction and then according to the type of the molds different sections are produced and wound around wooden spools.

● **Phase 2:** Drawing (Made in Italy)

The coils produced in phase 1 are size-drawn in drawing machine and then are packed to be delivered to the customer.

● **Phase 3:** Straightening and cutting (Made in China)

If the customer orders Busbar, the size-drawn coils are straightened in this section and then are cut according to the order.

## FACTORIES



## Conductor factory

**Specifications:** This factory has been founded on a 1,500 m<sup>2</sup> ground in Kaveh industrial city of Saveh province and the machinery and the equipment are obtained from Taiwan, Italy, Germany and England.



- **Entry:** The raw material is obtained from wire factory in varied dimensions.
- **Phase 1:** Primary Drawing & Annealing (Made in Taiwan)  
Here the copper wires are drawn and annealed continuously and the wire diameter can be reduced down to 1.38 mm.
- **Phase 2-1:** Secondary Drawing & Annealing (Made in Germany)  
For making stranded wires, now the wires made in the previous phase are drawn and reduced down to 0.19 mm.
- **Phase 2-2 & 2-3:** Stranding & bunching machine (Made in Italy and England)  
The stranding machine uses the wires made in phase 1 to make air conductors and the ones made in phase 2 to make bunched wires. There are two Buncher 630 machines for stranded wires and a Stamder 61 for conductors and a Buncher 1250 for earthing wires.



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## FACTORIES

## PRODUCTS AND STANDARDS:

### ● Copper Rod:

#### Shape and Dimension:

The non-welded copper rod produced by Upcast method wrapped in coil non-welded

| Product    | Dia. (mm)             | Coil weight (kg) |
|------------|-----------------------|------------------|
| Copper rod | 8, 10, 15, 16, 20, 25 | 3,500            |

#### Chemical composition:

| Alloy  | Denomination | Copper (%) | Oxygen (max ppm) | Standard conformance |         |          |          |
|--------|--------------|------------|------------------|----------------------|---------|----------|----------|
|        |              |            |                  | American             | Chinese | Europe   | Japanese |
|        |              |            |                  | ASTM(B49)            | GB      | EN(1966) | JIS      |
| CU-OFE | Oxygen-free  | 99.99      | 5                | C10100               | TU2     | CW009A   | C1011    |
| CU-OF  | Oxygen-free  | 99.95      | 5                | C10200               | TU1     | CW008A   | C1020    |

#### Mechanical properties:

| Product    | Electrical Conductivity (IACS) | Tensile Strength (N/mm <sup>2</sup> ) | Elongation (Min %) | Ductility (mm) | Mean size (mm) |
|------------|--------------------------------|---------------------------------------|--------------------|----------------|----------------|
| Copper rod | 101%                           | 240                                   | 28                 | 0.19           | 0.05           |

#### Packaging:

Packed on 1.5 x 1.5 wooden pallets.


#### Usage:

Power transmission and power distribution, copper conductors and cable industry.

### ● Copper & Aluminium sections:

#### Busbar

#### Shape and Dimensions:

| Thickness (mm) | Width (mm) | Length (m) | Shape   |
|----------------|------------|------------|---|
| 3-20           | 20-170     | ≤10        |  |



#### Coil:

| Thickness (mm) | Width (mm) | Length (m)    |
|----------------|------------|---------------|
| 2-20           | 20-170     | No limitation |

# PRODUCTS





### Rod, Square bar, Hexagonal, Round bar

| Shape         | Dimensions (mm) | Length (m) |
|---------------|-----------------|------------|
| Rod           | 8-80            | Up to 10   |
| Square rod    | 3-50            |            |
| Hexagonal rod |                 |            |
| Earth rod     |                 |            |



Small sizes are spool-coiled  
 Any profile or special section is producible due to order  
 All above products can be produced tin-coated

### Technical specifications and standards:

The non-welded copperwires produced by Upcast method wrapped in coil non-welded

| Alloy  | Main Element (%) | Standard conformance                      |               |                    |                 |
|--------|------------------|---|---------------|--------------------|-----------------|
|        |                  | American<br>ASTM(B49)                     | Chinese<br>GB | Europe<br>EN(1986) | Japanese<br>JIS |
| CU-OFE | Cu: 99.99 (min)  | C10100                                    | TU2           | CW009A             | C1011           |
| CU-OF  | Cu: 99.95 (min)  | C10200                                    | TU1           | CW008A             | C1020           |
| Al     | Al: 99.7 (min)   | Series 1000, 3000, 4000, 5000, 6000, 8000 |               |                    |                 |

#### Packaging:

Packed on wooden pallets.

#### Usage:

Electric and electronic industry, distribution panel.

## ● Conductors

### Hard conductors (air wire)

#### Technical Information:

Hard conductors stranded continually

| Normal Cross section | Number& Nominal Wire diameter | Approx Overall diameter | Approx conductor weight | Max D.C Resistance At 20 c | Cloulated Breaking load |
|----------------------|-------------------------------|-------------------------|-------------------------|----------------------------|-------------------------|
| mm                   | NR×mm                         | mm                      | kg/km                   | Ohm/km                     | KN                      |
| 10                   | 7×1.35                        | 4.1                     | 90                      | 1.8060                     | 4.1                     |
| 16                   | 7×1.70                        | 5.1                     | 142                     | 1.1385                     | 6.5                     |
| 25                   | 7×2.10                        | 6.3                     | 217                     | 0.7461                     | 9.9                     |
| 35                   | 7×2.50                        | 7.5                     | 308                     | 0.5264                     | 14.0                    |
| 50                   | 7×3.00                        | 9.0                     | 444                     | 0.3656                     | 20.2                    |

\* The above conductors can be produced tin-coated

#### Chemical composition:

| Alloy  | Denomination | Copper (%) | Oxygen (max ppm) | Standard conformance |         |          |          |
|--------|--------------|------------|------------------|----------------------|---------|----------|----------|
|        |              |            |                  | American             | Chinese | Europe   | Japanese |
|        |              |            |                  | ASTM(B49)            | GB      | EN(1966) | JIS      |
| CU-OFE | Oxygen-free  | 99.99      | 5                | C10100               | TU2     | CW009A   | C1011    |
| CU-OF  | Oxygen-free  | 99.95      | 5                | C10200               | TU1     | CW008A   | C1020    |

#### Standard:

In conformance with BSEN 60228 2005 version  
The weight is changeable due to order

#### Usage:

Overhead power transmission and power distribution.

PRODUCTS

### Soft copper conductors (earthing)

#### Technical Information:

Annealed conductors stranded continually with or without tin coating

| Normal Cross section | Number & Nominal Wire diameter | Approx Overall diameter | Approx conductor weight | Max D.C Resistance At 20 c | Cloulated Breaking load |
|----------------------|--------------------------------|-------------------------|-------------------------|----------------------------|-------------------------|
| mm                   | NR×mm                          | mm                      | kg/km                   | Ohm/km                     | KN                      |
| 50                   | 1.80×19                        | 9.0                     | 436                     | 0.3759                     | 19.8                    |
| 70                   | 2.10×19                        | 10.5                    | 593                     | 0.2762                     | 26.9                    |
| 95                   | 2.50×19                        | 12.5                    | 840                     | 0.1949                     | 38.1                    |
| 120                  | 2.80×19                        | 14.0                    | 1054                    | 0.1554                     | 47.8                    |
| 150                  | 2.50×37                        | 15.7                    | 1326                    | 0.1238                     | 60.1                    |
| 185                  | 2.50×37                        | 17.5                    | 1640                    | 0.1003                     | 74.2                    |
| 240                  | 2.25×61                        | 20.2                    | 2208                    | 0.0753                     | 89.0                    |
| 300                  | 2.50×61                        | 22.5                    | 2226                    | 0.0610                     | 122.3                   |
| 400                  | 2.89×61                        | 26.0                    | 3643                    | 0.0456                     | 163.4                   |
| 500                  | 3.23×61                        | 29.1                    | 4550                    | 0.0365                     | 204.2                   |

**Chemical composition:**

| Alloy  | Denomination | Copper (%) | Oxygen (max ppm) | Standard conformance |         |          |          |
|--------|--------------|------------|------------------|----------------------|---------|----------|----------|
|        |              |            |                  | American             | Chinese | Europe   | Japanese |
|        |              |            |                  | ASTM(B49)            | GB      | EN(1966) | JIS      |
| CU-OFE | Oxygen-free  | 99.99      | 5                | C10100               | TU2     | CW009A   | C1011    |
| CU-OF  | Oxygen-free  | 99.95      | 5                | C10200               | TU1     | CW008A   | C1020    |

**Packing:**

- Wooden or plastic coated metal spool
- Weight 100-500 kg
- The weight is changeable due to order

**Usage:**

Ground power transmission and power distribution, earthing system, electric and flexible cables

**Flexibel Conductors****Technical information and dimensions:**

Continually annealed stranded conductors

| Voltage(V) | Current capacity At 25 C° (A) | Max conductor Resistance at 20 C° | Weight (kg/km) | Mean diameter(mm) |     | Strands dia. (mm) | Nominal cross Section (mm <sup>2</sup> ) |
|------------|-------------------------------|-----------------------------------|----------------|-------------------|-----|-------------------|--|
|            |                               |                                   |                | max               | min |                   |  |
| 300-500    | 6                             | 39                                | 9              | 2.1               | 2.5 | 16*0.20           | 0.5                                      |
| 300-500    | 9                             | 26                                | 12             | 2.2               | 2.7 | 24*0.20           | 0.75                                     |
| 300-500    | 11                            | 19.5                              | 15             | 2.4               | 2.8 | 32*0.20           | 1  |
| 450-750    | 16                            | 13.3                              | 21             | 2.8               | 3.4 | 30*0.20           | 1.5                                      |
| 450-750    | 21                            | 7.98                              | 32             | 3.4               | 4.1 | 50*0.20           | 2.5                                      |
| 450-750    | 28                            | 4.95                              | 48             | 3.9               | 4.8 | 56*0.30           | 4  |
| 450-750    | 36                            | 3.3                               | 68             | 4.4               | 5.3 | 84*0.30           | 6  |
| 450-750    | 49                            | 1.91                              | 115            | 4.7               | 6.8 | 80*0.40           | 10                                       |

PRODUCTS

**Chemical composition:**

| Alloy | Denomination                  | Copper (%) | Oxygen (max ppm) | Standard conformance |         |          |          |
|-------|-------------------------------|------------|------------------|----------------------|---------|----------|----------|
|       |                               |            |                  | American             | Chinese | Europe   | Japanese |
|       |                               |            |                  | ASTM(B49)            | GB      | EN(1966) | JIS      |
| OFE   | Oxygen-free electronic copper | 99.99      | 5                | C10100               | TU2     | CW009A   | C1011    |

**Packing:**

- Wooden or plastic coated spring spool.
- Weight 400 kg
- The weight is changeable due to order

## Sydronic wire

### Shape and dimensions:

Continually annealed single core wire

Chemical composition:

| Product       | Diameter (mm) | Spool weight (kg) |
|---------------|---------------|-------------------|
| Sydronic wire | 1.38 and 1.5  | 400               |

| Alloy  | Denomination | Copper (%) | Oxygen (max ppm) | Standard conformance  |               |                    |                 |
|--------|--------------|------------|------------------|-----------------------|---------------|--------------------|-----------------|
|        |              |            |                  | American<br>ASTM(B49) | Chinese<br>GB | Europe<br>EN(1966) | Japanese<br>JIS |
| CU-OFE | Oxygen-free  | 99.99      | 5                | C10100                | TU2           | CW009A             | C1011           |
| CU-OF  | Oxygen-free  | 99.95      | 5                | C10200                | TU1           | CW008A             | C1020           |

Technical properties:

| Tensile Strength | Elongation (%) | Highest resistance in 20 C° (Ωg/m) |
|------------------|----------------|------------------------------------|
| 245-285          | 22-28          | 0.15328                            |

### Packing:

- Wooden or plastic coated metal spool
- Weight 400 kg

### Usage:

Wrapping industry





#### **TIN-PLATED COPPER ROD AND BUSBAR**

Tin-plated copper rod and busbar helps upgrade design and provides the best quality for switchgears, switchboards, electrical panels, power transformers and busducts by:

- Applications
- Switchboards, Switchgears, Electrical Panels, Power Transformers, Busduct, etc.

**PRODUCTS**

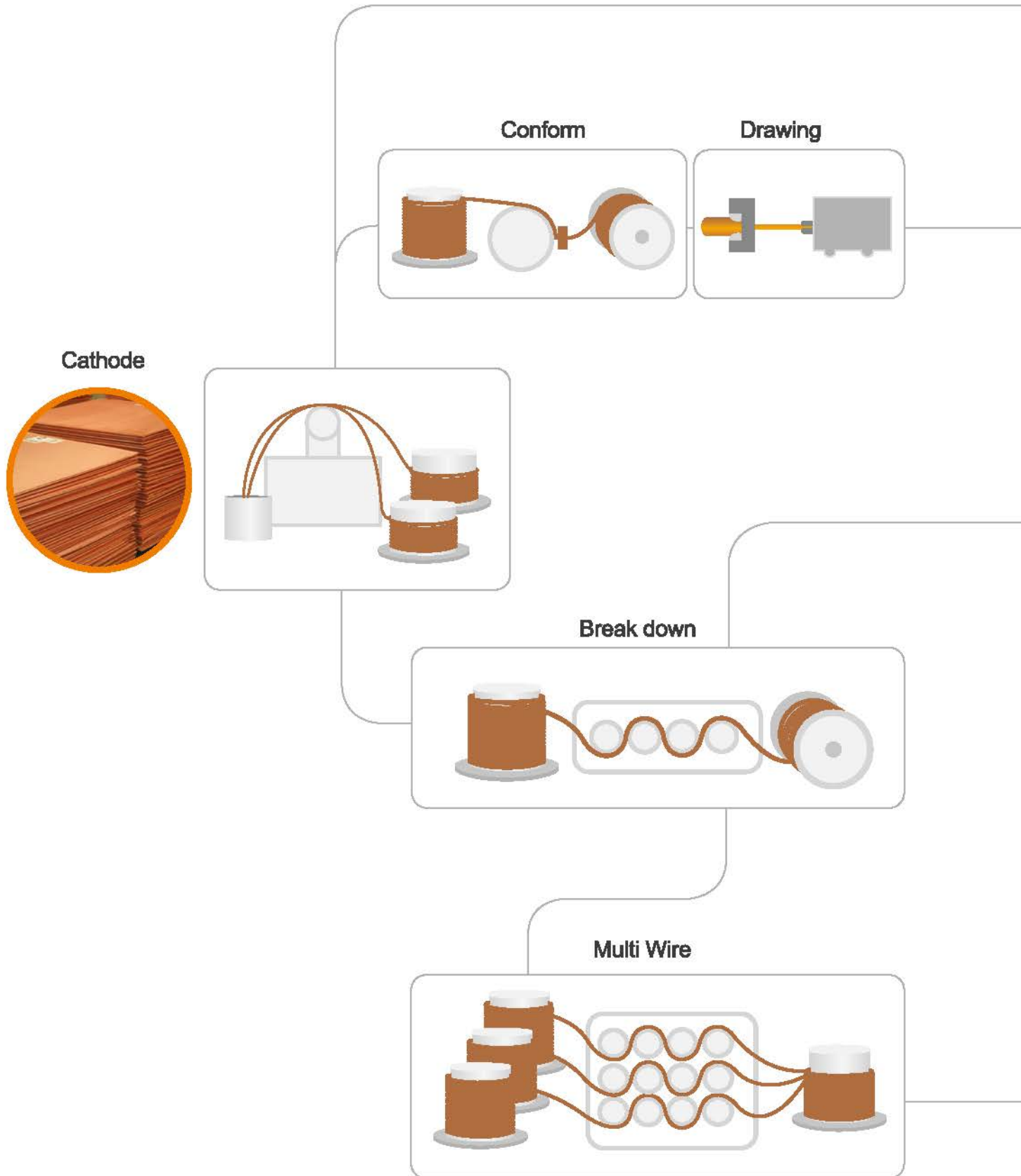
The Purity of Coating Material:

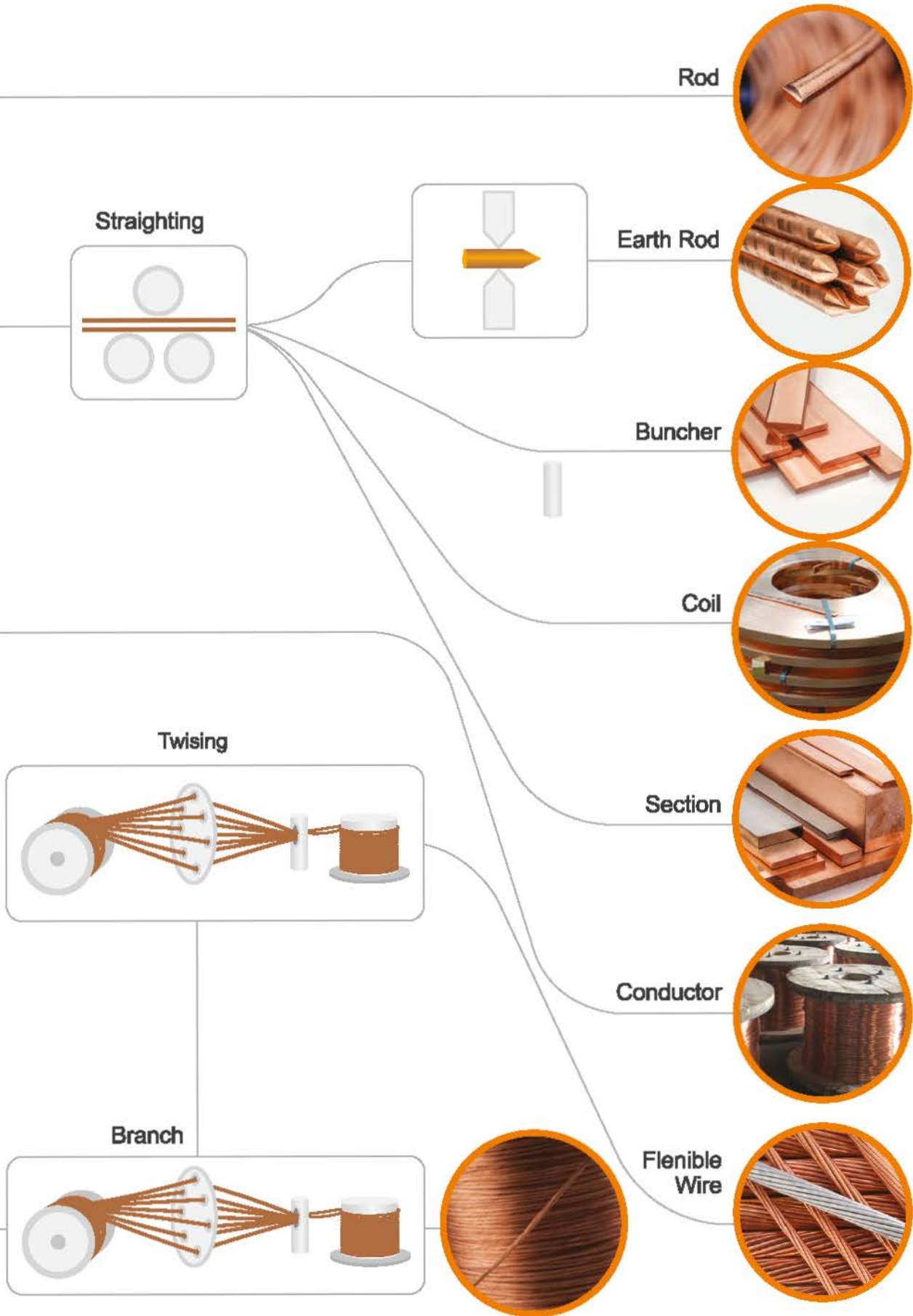
Tin anode, 99.5% up

Coating Thickness:

3 - 30 microns and as per customer's

# Production Process









## Quality control and laboratories

Controls are categorized in 3 main sections:

The raw material control and matching their properties with company needs.

Production inprocess control and matching with standards.

Final product control and issuing test report

### 1. The raw material control:

All entry material that are influential to the product quality are inspected upon entering the factory and just in case the quality control unit approves their conformance with the predefined acceptance criteria, they are allowed to the production line.

### 2. Production inprocess control:

All intermediate products are inspected in each level of production line and if they meet the technical specifications, they are used in the next level. The inspection status is recorded on the cards designed for each level of production and attached to the wrapping. The nonconformant intermediate products cannot be used in processes unless they are corrected and verified. Generally in all production phases the dimensional examination and mechanical and electrical properties of the conductor are in control.

### 3. Final product control:

The final products are inspected as well. This control consists of dimensions, contact and disconnect, electrical resistancy, wrapping and ...

obviously, none of the above are attainable unless having suitable equipment and Mesbar Kaveh quality control lab employs precise lab equipment to serve the customers as best.

- Dimensional measurement tests (0.001 mm precision)
- Micro ohm meter devices for measuring electric resistancy (up to 30 kΩ)
- Sigma test devices for measuring electric conductivity
- Oxygen test devices for measuring oxygen level
- Weigher devices (up to 30kg)
- Hardness measuring devices (up to 130 Vickers)
- Twist measuring devices per rotation
- Tensile strength device (diameter up to 4 mm)
- Elongation test device (diameter up to 20 mm)
- Punch and bend test device
- Quantometer instrument for analyzing material
- Refractometer instrument (up to 32% Brix)

**Available test**

|   | Kind of test                        | Standard              |
|---|-------------------------------------|-----------------------|
| 1 | Number, size, resistance and weight | DIN 48201             |
| 2 | Electrical resistancy               | IISIRI 3084           |
| 3 | Tensile strength                    | ASTM B3               |
| 4 | Wire Length and twisting            | ASTM B49<br>ASTM B193 |
| 5 | Busbar electrical conductivity      |                       |
| 6 | Busbar electrical resistancy        | DIN 13601             |
| 7 | Busbar dimensios and weigh          | DIN 13599             |
| 8 | Busbar bend, twist and hardness     |                       |

**QUALITY CONTROL**

