

**Packaging: Delivered condition - reference values**

Lead frames							
Reel	Strip thickness [mm]	Strip width [mm]	Coil ext. Ø max. [mm]	Coil int. Ø min [mm]	Coil max. kg	Standing rack	Rack max. kg
	to 0.8	to 80	tbd	tbd	tbd	possible	2000
	from 0.8	from 80	1400	tbd	500	necessary	2000
	Axis diameter - holder diameter						
	d <sub>A</sub> min	20 mm up to 100 kg	30 mm up to 200 kg	40 mm up to 250 kg	50 mm up to 300 kg	300 mm up to 500 kg	
Pallet wound in layers	Strip thickness [mm]	Strip width [mm]	Coil ext. Ø max. [mm]	Pallet max. kg	Minimum deflection or bending radius [mm]		buckling/kinking possible
	up to 0.8	up to 80	1200	2000	tbd		tbd
	from 0.8	ab 80	1200	2000	200		yes
Full strip							
Coil: Pallet wound in layers	Strip thickness [mm]	Strip width [mm]	Coil ext. Ø max. [mm]	Coil int. Ø min [mm]	Coil max. kg	Standing rack	Rack max. kg
	up to 0.8	up to 80	1000	300	tbd	no	no
	from 0.8	from 80	1000	400	tbd	no	no
Coil: Pallet wound in layers	Strip thickness [mm]	Strip width [mm]	Pallet ext. Ø max. [mm]	Pallet max. kg	Minimum deflection or bending radius [mm]		buckling/kinking possible
	up to 0.8	up to 80	1200	2000	tbd		tbd
	from 0.8	from 80	1200	2000	200		yes

For special sizes of the ring internal diameter (RID), we kindly ask you to provide a corresponding internal core.  
Unless other arrangements are made, the delivery = handover.  
When placing an order, please always provide a corresponding unfilled packaging unit (e.g. empty reel, empty pallet, etc.)

**Electroplating**

**Plating run out:**

For flat surfaces: up to the measurement point required plating thickness is within specified tolerance, after the measurement point plating thickness runs out.

For peaks the measurement point is the middle of the peak: at the measurement point required minimum plating thickness, from the measurement point the plating runs out on both sides.

Stamping edges: unless specified in the offer, not a subject of analysis.

**Free areas:**

**Undefined free areas:** Areas which are not plated are undefined areas.

A typical example of this are free areas in the middle of the strip. These areas tend to form oxides

**Defined free areas:** Raw material free areas have to be separately defined.

Traces of nickel, silver, gold, oxidation, or other environmental influences are not excluded.

If corresponding protective measures are required, these have to be defined in consultation with the customer, in particular when these are functional areas (e.g. welding, sticking with adhesive, bonding, etc.).

## Technical Cleanliness

### Particles:

The assessment of technical cleanliness is based on the fundamental analysis according to VDA volume 19. The inspection is made before winding. This represents a snapshot of the technical cleanliness of the component directly after the electroplating process (without packaging or transport) and is not representative for the series production. If articles are to be explicitly examined, the examination must be separately ordered.

This is correspondingly true for coatings or similar characteristics

### Substance residues:

We assume a usual level of greasing/contamination.

The auxiliary materials used such as oils and passivation agents have to be examined and released by EBB, or in consultation with the customer and EBB compared to a list of approved stamping oils.

The following auxiliary materials can lead to defects such as stains and adhesion and wetting problems in the electroplating process: paraffins (petroleum jelly); substances containing teflon (e.g. forming oils, additives or polymers); silicones and substances containing silicon (in particular organopolysiloxane); silicon and calcium sulphate; lithium grease; non-polar oils (short-chain isoparaffins); heavy oils; graphite; molybdenum sulphide; polyalphaolefins

and the following special stamping oils:

Rivolta (S.K.D. 16, S.K.D. 4002); Oest (Meba H 3111, Platinol B208); Sestral (CST 4); Avia/ Bantleon (Avilube Metapress 9901); Weicon (chain and rope spray/ art. no.: 11500400); Scharr (Conducut 4651); Raziol (CLF 25 E, AL V); oelheld GmbH (DiaPress MFP); roloil (isomov - ms); or substances which have a negative effect on the wetting.

### Absence of silicon:

EBB plating processes are free of silicon. The masking tapes used for the adhesive tape technology include adhesives containing silicon which are compatible to electroplating. Process steps upstream and downstream, provided packaging materials or other influences are excluded by EBB.

## Whiskers

Sn coatings generally tend to form whiskers. Using an adequate Ni blocking layer the formation of whiskers due to the diffusion of particles can be reduced.

## Silver (Ag) surfaces

### Ag:

Ag semi-gloss > 80 HV

### Thiol (ODT) passivation:

For silver enquiries without a passivation specification, we offer surface protection with thiol passivation as standard.

For silver surfaces without passivation there is always the possibility of tarnishing.

The passivation effect considerably increases the resistance to tarnishing of silver.

The temperature and abrasion resistance, the friction reducing effect and the conductance values which depend on the thickness of the coating have to be considered with regard to processes downstream, the application area and the lifecycle of the contact system during the design. A carryover into other areas is possible.

#### Selective silver:

For selective silver plating Ag splashes/residue in the remaining or transition area cannot be excluded.

#### Gold (Au) surfaces

##### AuCo:

120-200 HV 0,025

The realisable cobalt concentration in the hard gold layer is 0.10 - 0.40 weight %.

#### Tin/lead (SnPb) surface

For enquiries with a tin/lead requirement, we assume that the customer has taken the applicable laws into consideration.

We expressly point out that we only offer this surface plating on the request of the customer.

As far as the legal regulations prohibit plating with a lead content, we reserve the right to withdraw from the offer or contract.

#### Electropolishing

Electropolishing is carried out subject to a final specification.

#### Lubrication

A carryover into other areas is possible.

#### Tape process

The taped areas are likely to have some infiltration.

We require that the sticking surface when delivered is in a clean state and free of grease and particles.

#### Surface roughness

Ra/Rz: the electroplating reflects the topography of the delivered surface roughness. If the product is brushed, we exclude the Ra/Rz requirements.

#### Insertion force

The press-in forces or pull-out forces are not electroplating characteristics and are the responsibility of the manufacturer of the contact.

#### Strip characteristics

**Strip inlet:** The pin tip arrangement must not be configured to be in the running direction of the strip plating line.

**Breaking points:** We assume the predetermined breaking points are sufficiently stable.

**Strip camber:** The assessment of the manufacturability is valid to a max. 1.5 mm per metre.

**Torsion / twisting:** The assessment of the manufacturability is valid to a max. 12° per metre.

**Accum. pitch error:** This must be assessed according to the article and the production process used.

**Pre-plating:** We give no warranty for pre-plating and pre-cladding.

**Rolled pins:** For the flow away of the electrolyte, at the end of the pin there must be a sufficiently large enough rinsing opening which has a size of at least 0.50 mm.

In tight capillaries there is the risk of liquid residues which can lead to stains and corrosion.

**Seam area:** Due to an insufficient rinsing possibility there is the risk of liquid residues which can lead to stains and corrosion.

### **General points**

#### **Product design:**

The ordering party is responsible and liable for the product design.

The ordering party is responsible to check and approve the product for functionality and feasibility.

#### **Delivered Material**

We accept no liability for previously made plating processes and claddings.

#### **Guarantee for component integrity after storage through Enayati**

Enayati has no control over the main factors which affect the defined parameters.

We therefore, offer no guarantee for the integrity of components after storage.

#### **General tolerances:**

Compliance with general tolerances and geometric tolerances of stamping drawings is not included in this offer.