1. GENERALS

A conductive matherial dipped in a proper solution could give rise to insoluble electrodepositions' products because of the transformation of the electric work of the equipment to a chemical work.
All the electrolytical processes may cause the deposition of the insoluble film that suit the metallic-surface in order to protect it and improve some chemical and physical details.
Compared to a surface-converting reaction, the superficial metal does not react chemically but is simply protected (catodic protection) by a less noble metal that can be easily early oxidized: in this case zinc acts as a sacrificial anode.
Hence the surface will not get rusty if there are any zinc particles close to the exposed area (sacrificial anode).
In order to obtain a perfect performance of the treatment, the substrates' surface has to be prior prepared through the parameters described as follow, furthermore the already processed item can be easily improved as chemical and physical characteristics by a proper sealing step.

2. APPLICATION

The present procedure is suitable to all metals and alloys that presents electic-conductivity properties. In particular on bolts, nuts, odds and ends and items up to 7,5 metres long.
There are two different procedures (plants): by jigs and by barrels. The barrels are made by glass-PVDF, a proper matherial designed to avoid marks on threads and dents.
The present procedure is performed with respect to the norm UNI-ISO 2081/2009.

3. CYCLE

CHEMICAL-CLEANING: this step concerns the items dipping in a concentrated alkaline-bath at the operative temperature of 50-55°C for about 50 minutes (30 minutes for jigs), in order to degrease the surface and eliminate all the organic compounds (the time is strictly related to the amount of grease-oil on the goods). In fact the organic substances act as insulator against the electronic transfer which is the core of the electrolytic system.

PICKLING: to eliminate the presence of inorganic oxides on the items' surface this step becomes indispensable. The bath consists in a solution of chloridric acid where the items may stop for about 30 minutes depending on the amount of oxides on the surface.
However this step can be even avoided if the surface does not present any oxides.

RINSING: the rinsing step allows to neutralize the superficial pH therefore with a neutral pH the reactions on the surface are more efficient and it allows to avoid the pollution between different chemical baths. It is performed by a water-flow combined with air-bubbling for at least one minute.

ELECTROLYTIC-CLEANING: this step concerns the items dipping in a concentrated alkaline-bath with a voltage applied for about 10 minutes, in order to definitely eliminate the superficial organic phase. The developed anodic-current generates a mechanical oxygen bubbling that induces a cleaning. Furthermore, it allows smoothing a bit the surface that combined with the elimination of the organic apolar compounds let obtain a better and perfectly clinged film.

ACTIVATION: is the process of dipping in a neutralizing acid bath to activate the substrate porousness.

ELECTROLYTIC GALVANIZING: it is the electrodeposition of a protective tin-film on a surface through an electronic transfer applied by a voltage.
The protective film guarantees the corrosions' resistance when it appears homogeneous and thick enaugh (minimum thickness adviced is 5 microns) because it protects the item as a catodic protective film.
The temperature is mainteined at 30°C. The bath is acid by zinc chloride and other chemicals controlled and monitored by a process service.
The process is controlled by frequent aesthetic controls on the processed goods, by the thickness test, by the salt-fog cabinet to check the corrosion resistance.

PASSIVATION: is the final step of the galvanizing. The passivation is necessary to prevent any corrosion from agressive agents. Usually, depending on the corrosion resistance, there are two kind of passivation without hexavalent chrome (see the table page 3).
With regards to the RoHS norms and European reports concerned environmentals subjects, the passivation baths are the following:
-yellow passivation (trivalent chrome)
-white passivation (trivalent chrome)
-iridescent passivation (trivalent chrome)
The passivation is the stratification of an high resistance inorganical film on the zinc. The zinc layer is therefore improved by a combined film with higher electric potential, hence more corrosion resistance because of the anodical protection of the zinc layer.

SEALING (OPTIONAL): in order to obtain a better product to resist more against the aggressive agents this step becomes fundamental. It is performed through an item-soakage into emulsifying oil like the torque-n-tension (30%), finigard (f105) or crude oil like ANTICORIT 77 (FUCHS).

DRYING: depending on the kind of matherial it is performed by a timed and temperature-controlled spin-dryer machine (oven).

ELECTROLYTIC GALVANIZING (FASTENERS ON BARRELS)

Passivation	**Sealing**	**Thickness** (UNI 3497/01 or UNI 2177/98)	**Corrosion test** (UNI 9227/06-NSS)	
			White products	Red products
White	#	5-8 microns	6 h	48 h
White	#	8-12 microns	6	72
White	#	12-16 microns	6	96
Yellow	#	5-8 microns	72	120
Yellow	#	8-12 microns	72	144
Yellow	#	12-16 microns	72	168
Galvanizing norm FIAT 9.57405	Iridescent	Fe/Zn 7 IV (min 7)	96	168
Galvanizing norm FIAT 9.57405	Iridescent	Fe/Zn 12 IV (min 12)	96	240
Galvanizing norm FIAT 9.57405	Iridescent/F105 SEAL	Fe/Zn 7 IV-S (min 7)	120	360
Galvanizing norm FIAT 9.57405	Iridescent/F105 SEAL	Fe/Zn 12 IV-S (min 12)	120	480

ELECTROLYTIC GALVANIZING (ITEMS ON JIGS)

Passivation	**Sealing**	**Thickness** (UNI 3497/01 or UNI 2177/98)	**Corrosion test** (UNI 9227/06-NSS)	
			White products	Red products
White	#	10-20 microns	6 h	96 h
White	F401 SEAL	30-40 microns	24	240