

# NIDIP

## LEGOR ELECTROLESS NICKEL LINE

**Electroless (chemical) Nickel-Phosphorus Plating is the most important catalytic process used in the last two decades.**

LEGOR has **three types of coatings:**

- Low phosphorus coatings (2-4% P by weight)
- Medium phosphorus coatings (7-9% P by weight)
- High phosphorus coatings (>10.5% P by weight)

Some of the **most important characteristics of these coatings are:**

- High wear and corrosion resistance
- Excellent uniformity
- Great range of thicknesses
- Excellent mechanical, and physical properties
- Good solderability and superficial lubrication

**The properties of the coatings depend on the quality and content of phosphorus.**

The coatings with low phosphorus content are crystalline and hard, so they have a high wear resistance. On the other hand, the high phosphorus content coatings are amorphous and have a high corrosion resistance.

Generally, all the types of coatings have good adherence. Though, the adherence properties depend on some parameters as are the thickness of the layer, phosphorus content, heat treatment and the ductility of the substrate.

The nickel-phosphorus coatings are self-lubricating and have a good friction coefficient.

**A very important and unique characteristic of the electroless coatings is the uniformity of the layer on the same surface;** the electroless coatings emulate perfectly the substrate surface.



## SOME OF THE PROPERTIES OF THE NICKEL-PHOSPHORUS COATINGS:

LEGOR Product Code Phosphorus content	<b>NIDIP840</b> Low content 2-4 % (by weight)	<b>NIDIP850</b> Medium content 7-9 % (by weight)	<b>NIDIP860</b> High content 10-12 % (by weight)
Microstructure	Crystalline	Lamellar	Amorphous
Materials to be treated	Aluminium and its alloys	Cast iron	Cast iron
	Brass	Alloys of aluminium	Stainless steel
	Cast iron	Carbon steels	Highly alloy steels
	Carbon steels, etc.	Stainless steel	Aluminium and its alloys
		High alloy special steels	Brass
		Brass	
HV hardness for 75 µ thick deposit	600 - 700	480 - 590	450 - 550

## SOME APPLICATIONS OF THE NICKEL-PHOSPHORUS COATINGS:

Post-heat treatment HV hardness for storage with thickness 75 µ (T.T.= 1 h at 400 C)	1000 - 1200	> 950-1000	> 950 - 1000
<b>Wear resistance:</b>			
Taber index for 1000 cycles : mg lost	10 - 12	13 - 15	16 - 19
Taber index for 1000 cycles after T.T.	4 - 8	4 - 8	4 - 8
<b>Corrosion resistance (ASTM B 117)</b>			
25 µ carry-over to Al.	Ra 0,02 - 24 hour	Ra 0,02 - 100 hours	Ra 0.02 - ≥ 1000 hours
25 µ carry-over to carbon steel	Ra 0,02 - 24 hour	Ra 0,02 - 100 hours	Ra 0.02 - ≥ 1000 hours
Melting point (t C)	1260 - 1425	880 - 960	880 - 960
Magnetic properties	Weakly magnetic	Weakly magnetic	absent
Electrical resistivity (micro-Ohm/cm)	20 - 30	50 - 100	50 - 100
Ductility (%)	0.3 - 0.5	0.5	1.5 - 1.6
Elongation (%)	0.3 - 0.5	0.7	1.5 - 1.6
Coefficient of thermal expansion (µ/m/sl C)	13 - 15	13 - 15	13 - 15
Thermal conductivity (cal/cm/sec/ste C)	0.0105 - 0.0135	0.0105 - 0.0135	0.0105 - 0.0135