

## Rod Wire pickling and phosphating

The steel material phosphating process has the purpose to produce a surface conversion layer, at thin and compact thickness strongly anchored on the surface, in order to facilitate the cold deformation or the further drawing operations.

It exists different type of phosphate. For rod wire, the most frequently used is the zinc phosphate. After phosphating, an opportune covering with lubricating layer on the phosphated surface is necessary.

It is unavoidable that the surface to be phosphated results perfectly clean, without oil and grease, metallic oxides and acidity. This is usually guaranteed by using chemical pickling operation (with  $H_2SO_4$  or  $HCl$ ) and subsequent strong water washing or by means of shot-blasting operation. The phosphating process is generally carried out by material dipping into hot solution tank with dipping time linked to the expected layer thickness.

For stainless steel material the phosphating process is not applicable and it is replaced by salt coating operation.

New technologies based on special polymers have been recently developed to prepare surface for cold forming in alternative to phosphate. This technology that is sludge free and can be applied at temperature of about  $40^{\circ}C$  has huge advantages in terms of energy savings and water consumption as well as for maintenance.

The coils handling that is usually fully automatic in Sirio Wire equipment is made with special bridge-cranes equipped with rigid slideways to avoid oscillations. The bridge crane will move in 2 or 3 axis depending on customer requests.



General View of a Sirio Wire line

## SIRIO WIRE s.r.l.

Capitale sociale: € 95.000,00 i.v.

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Sirio Wire takes special care to environmental aspect. Our tanks are equipped with suction hoods on each of its edges and tilting automatic semi-covers. In addition the bridge crane is equipped with suction hood/enclosure to guarantee the complete capture of gas and vapours during hook extraction from the bath, which will have open covers. The sucked gas and vapours will be neutralized by scrubbing system before to be discharged into atmosphere at polluting concentration according to the recommendations of A.C.G.I.H. (American Conference of Governmental Industrial Hygienists).



View of automatic opening of semi-covers



View of the canopy hood on the bridge crane

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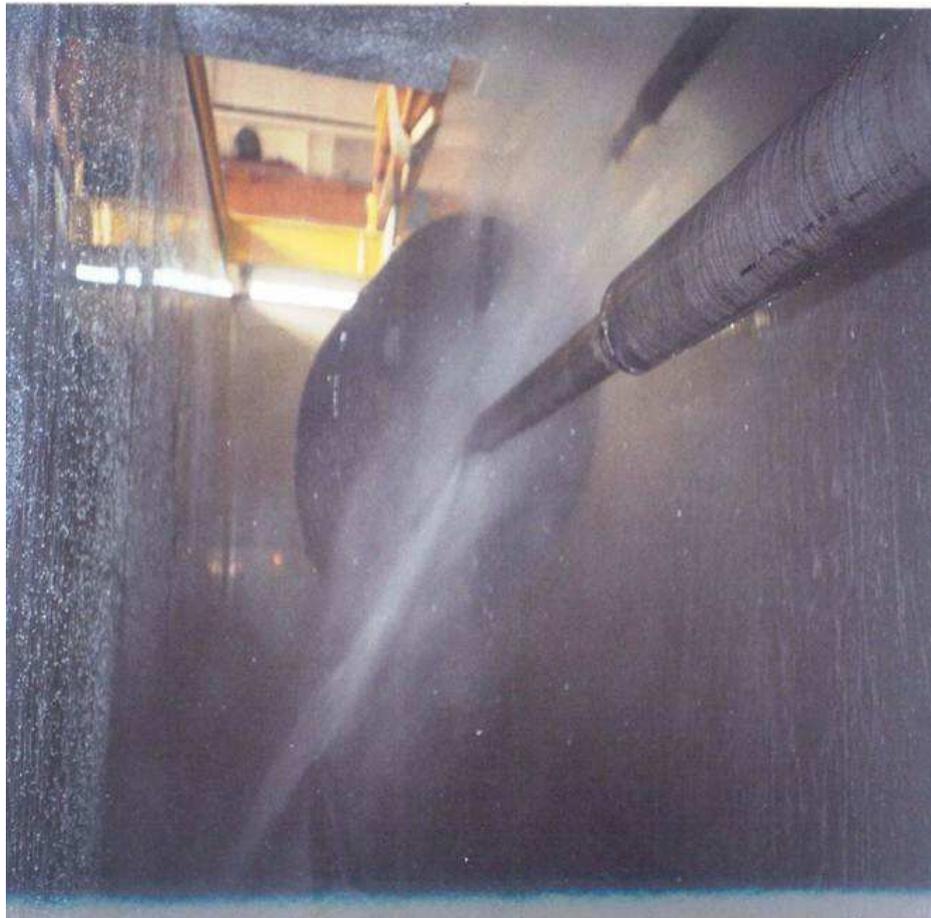
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Another very innovative features Sirio Wire is applying on its lines is the high pressure rinsing device that is particularly important for rinsing of high carbon steel rod wire after pickling. A special trident device with nozzles is rotating and translating around the coil and insures the complete cleaning (inside and outside the coil) of the pickled material with the elimination of carbon residuals (smut) formed in pickling step



View of Sirio high pressure rinsing device

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The dynamic pickling can also be proposed and consists in a vertical turbine that is positioned on the outside tank head. This device produces a vigorous and effective solution recycling, homogenizes the bath solutions and accelerates the surface reactions of the reagents on the metal surface immersed reducing treatment times (up to 50%). The dynamic pickling device increases the overall efficiency of the process allowing you to use a lower concentration of the reagents.



View of dynamic pickling device

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