

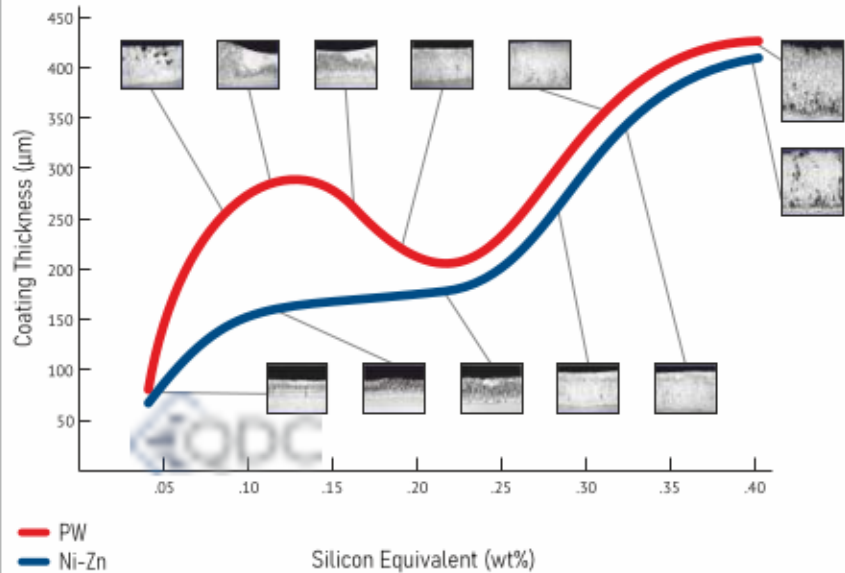
The highest zinc coating is reached when the silicon in the steel is 0,04 to 0,12%, this range is called the 'Sandelin Curve'.

**Sandelin Effect**



**Effect of Nickel on Coating Thickness (Sandelin Effect)**

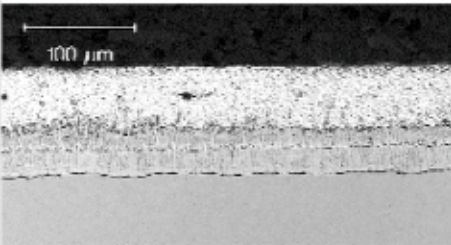
Galvanized at 455°C for 8 minutes



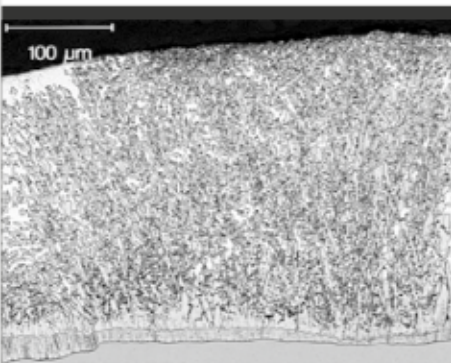
From this graph, it can easily be seen that the addition of nickel to the zinc bath decreases the coating thickness significantly when the silicon equivalent of steel is in Sandelin range.

**Why Nickel?**

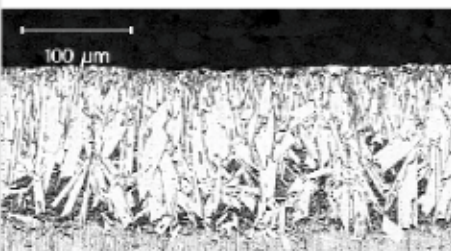
- Reactive Steels;
  - Prevents high coating thicknesses.
  - Prevents growth of Fe-Zn alloy layer.
  - Prevents dark grey coatings.
  - Prevents peeling of coating.
  - Increase the coating homogeneity.
- Zinc saving from 5% to 15% in weight.
- Increase coating ductility.
- Smoother and brighter surface finish.
- Increase the fluidity of the Zn bath.
- Aesthetical coating appearance.



Normal coating



Bearded coating



Reactive coating



### Why Nickel Tablet?

- Less Nickel using up to 30% compared to Zinc-Nickel alloy ingot and powder Nickel applications.
  - Zinc Nickel Alloy Ingot, 1.7 kg Ni addition per ton zinc.
  - Nickel Powder 1.8 kg Ni addition per ton zinc.
  - Nickel Tablet, 0.75 - 1 kg Ni addition per ton zinc.
- The implementation is very simple and fast.
- No special expertise or tools required.
- Nickel floats on the surface of the zinc bath more than other methods, therefore does not settle down to zinc ash and dross.
- Nickel automatically dissolves in zinc bath.
- No dependency on purchasing of HG / SHG Zinc.

### Why ANI METAL SmartNi?

- Others: Nickel + Wax
- ANI Metal SmartNi: Nickel + Wax + X (X is our "know-how").
  - ANI Metal SmartNi create more heat shield when burn off therefore they prevent consumption by oxidation.
  - Increases the solubility in zinc.
  - Prevents the precipitation to dross.