



Kennis en kunde in de keten – Voorbeeld 1:

Electro Coating

20 april 2010

Marcel Zwart, Surface Treatment Engineer

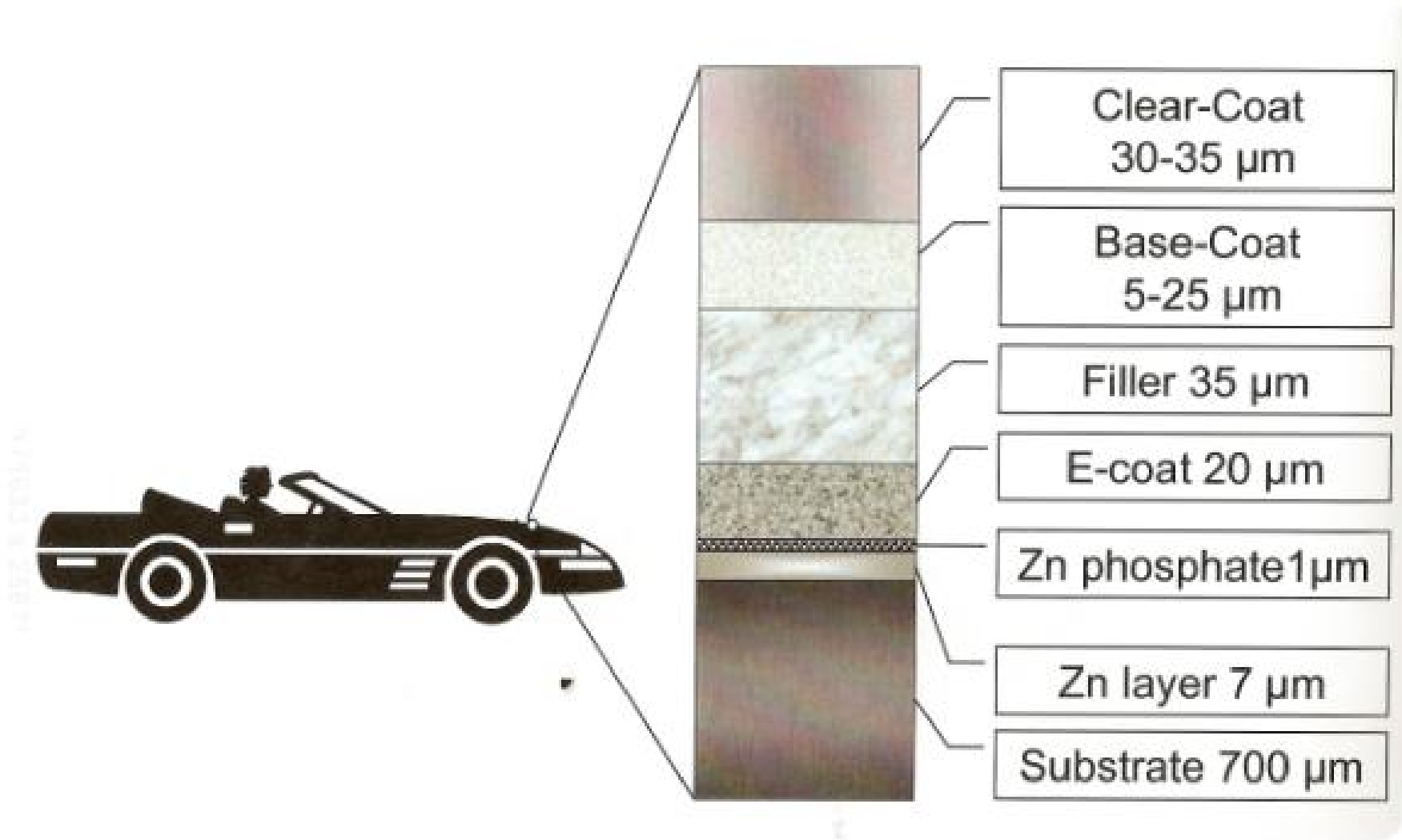
voestalpine Polynorm
www.voestalpine.com

voestalpine
ONE STEP AHEAD.

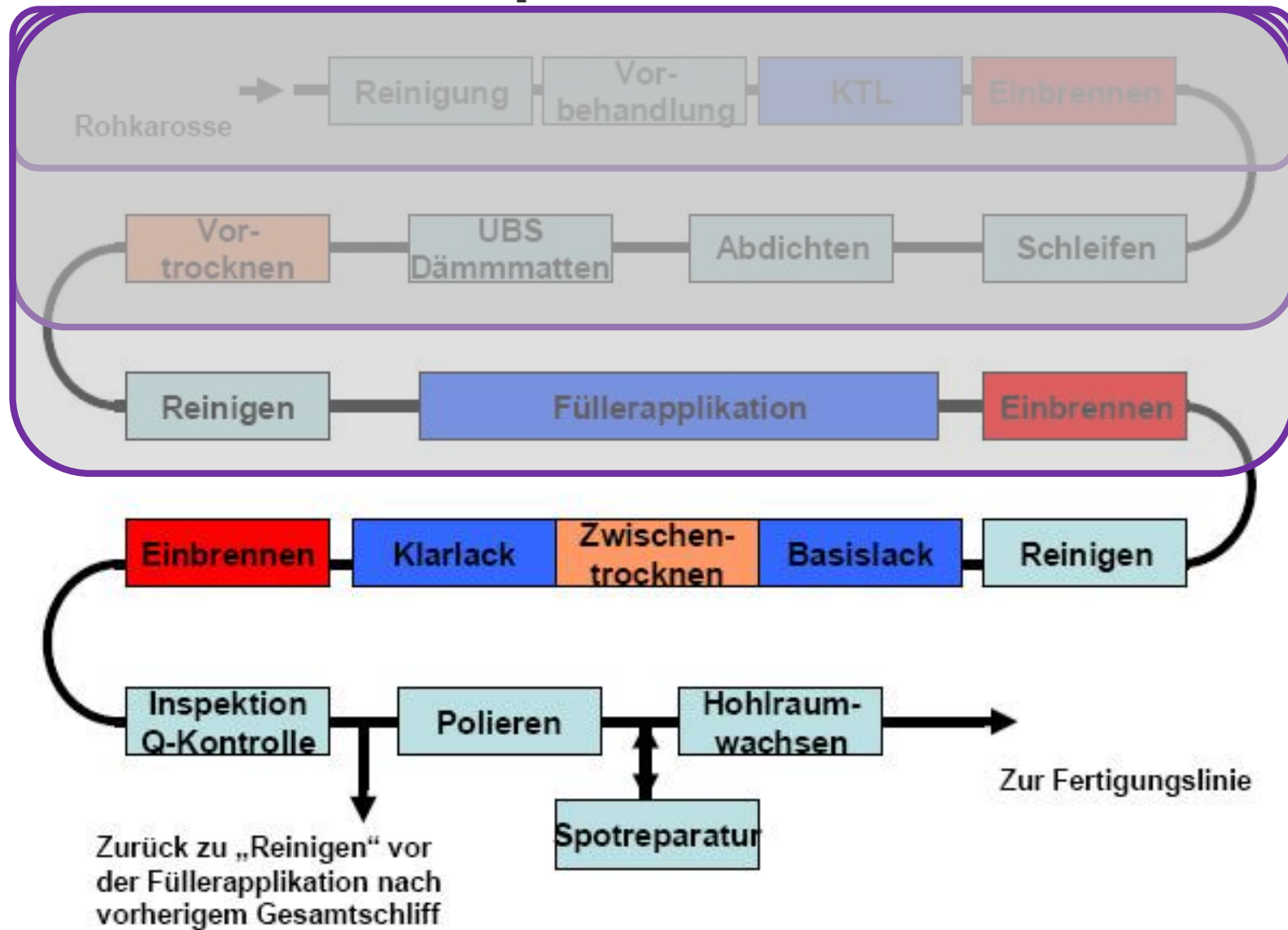
Onderwerpen

- Carrosserie lakproces
- Onze plaats in de keten
- KTL proces Polynorm
- Processtappen, functie
- Rondleiding KTL-lijn

Carrosserie lakopbouw

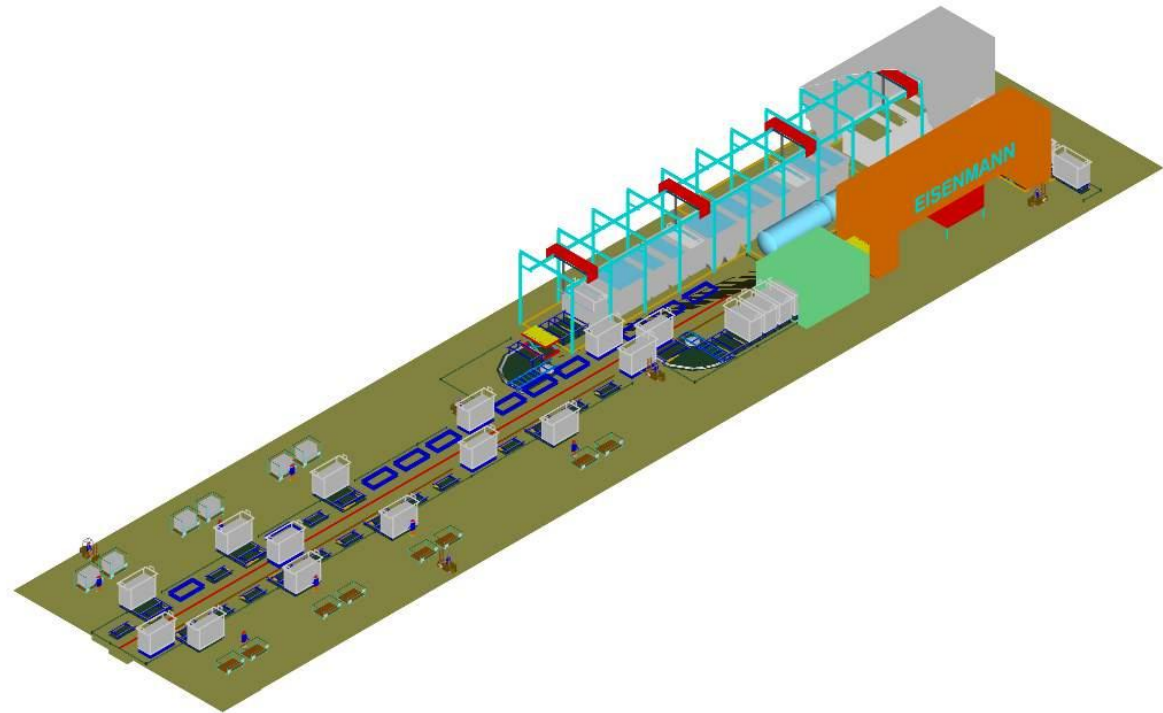


Procesflow – onze plaats in de keten

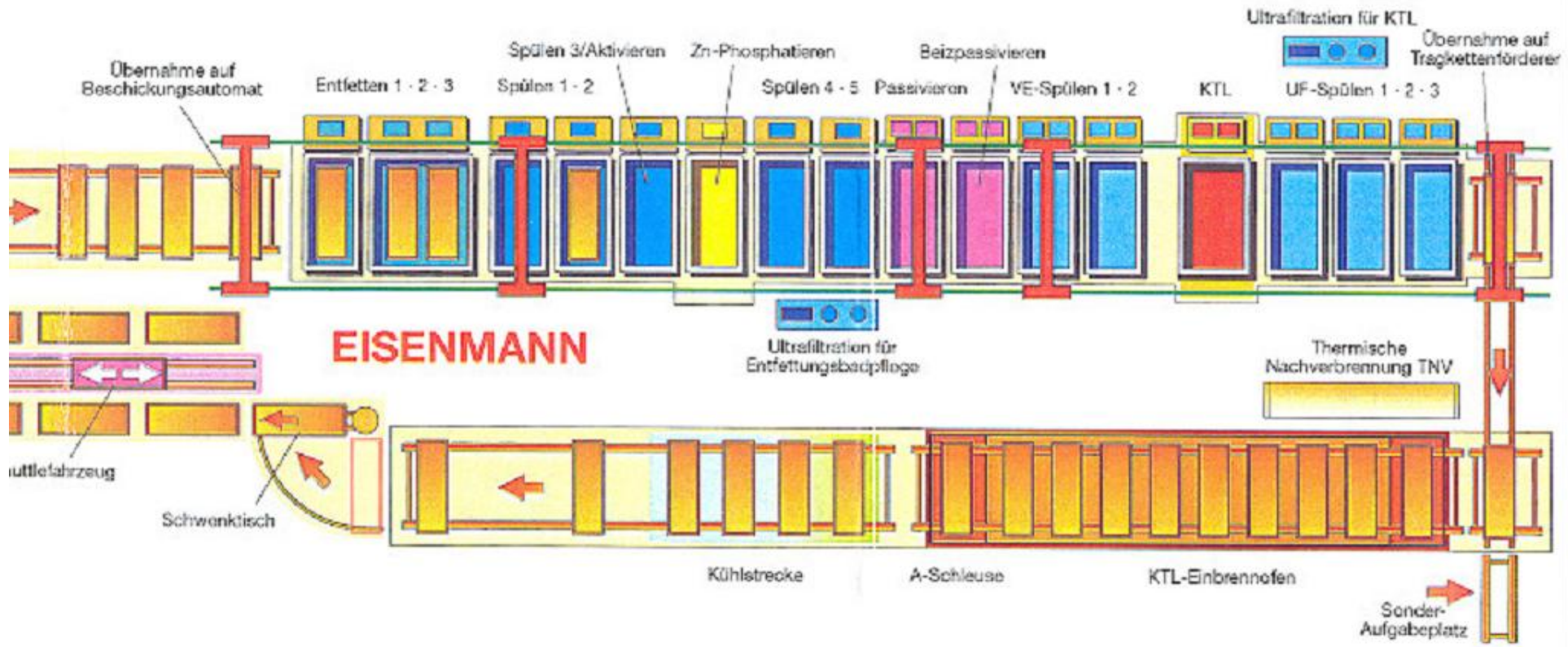


E-coat lijn Polynorm

- Ophangen
- Voorbehandeling
- KTL
- Uitharden
- Afhalen
- Verpakken



Badenreeks



Voorbehandeling, Fosfatatie

- Ontvetting: Verwijderen van olie, vet, stof,
Bevochtiging van oppervlak



- Aktivering: Kiemen voor fosfaatkristallen (titaanzouten)
→ Snellere fosfatering & dunnere fosfaatlagen
- Fosfatering: Aanbrengen van conversielaag tbv corrosiebestendigheid en lakhechting
- Passivering: Extra bescherming bij eventuele defecten in fosfaatlaag.

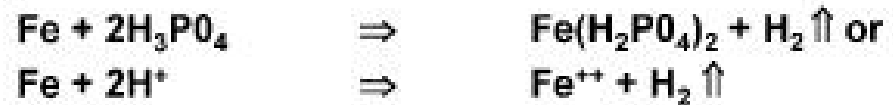
Zinkfosfatering: Samenstelling van het bad

- Fosforzuur
- Zink als Zinkfosfaat $\text{Zn}(\text{H}_2\text{PO}_4)_2$ of Zinknitraat $\text{Zn}(\text{NO}_3)_2$
- Versneller Nitriet NaNO_2
- Andere zware metalen, Ni & Mn
- Fluorides

Mechanisme

- Aanetsen oppervlak

- on steel:



- on zinc (e.g. galvanized steel):



- on aluminium:

(1) Dissolution of the Al oxide layer:



(2) Pickling attack on the metallic aluminium:



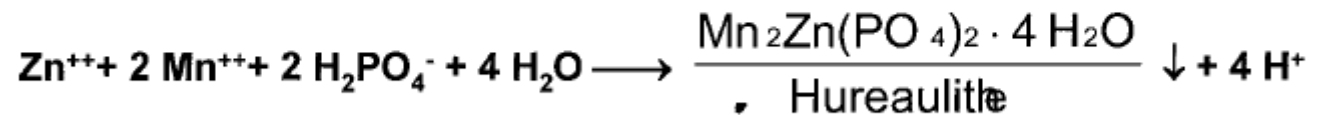
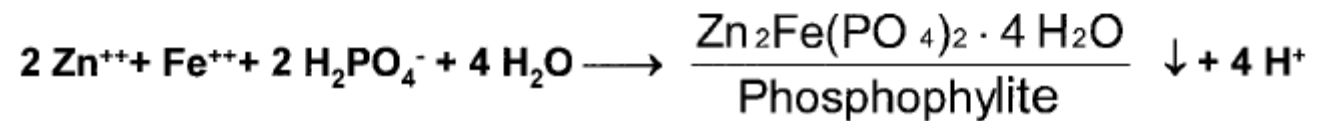
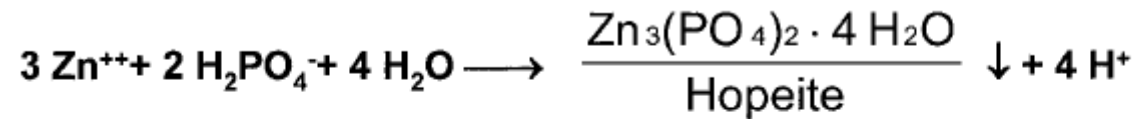
(3) Complexing and precipitation of Al³⁺:



- Toename pH in de grenslaag

Mechanisme

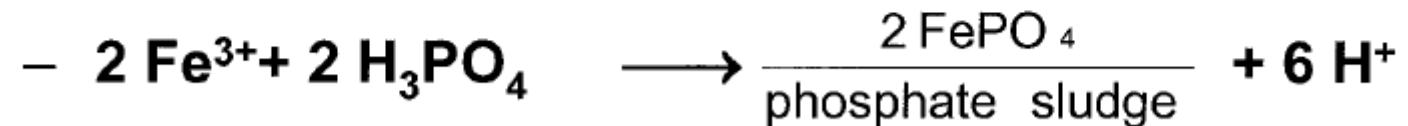
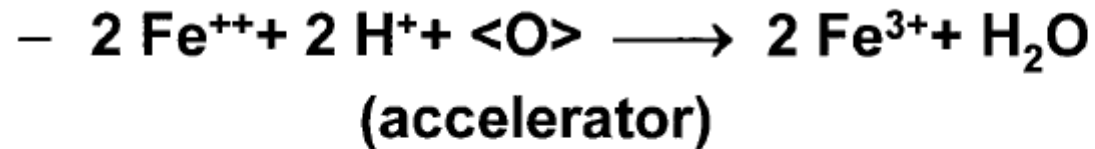
- Neerslaan van Zinkfosfaat op produkt door onoplosbaarheid bij hogere pH



- Groeien van de kristallen

Mechanisme

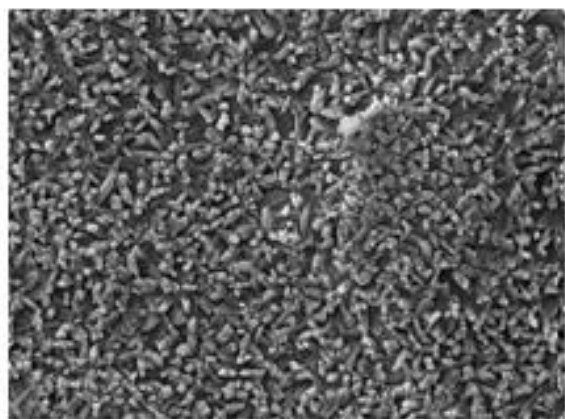
- Slibvorming (staal)



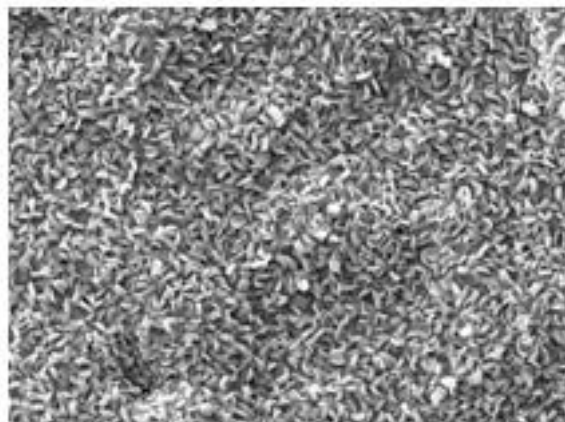
- Oxidatie van Waterstofgas uit beitsreactie.



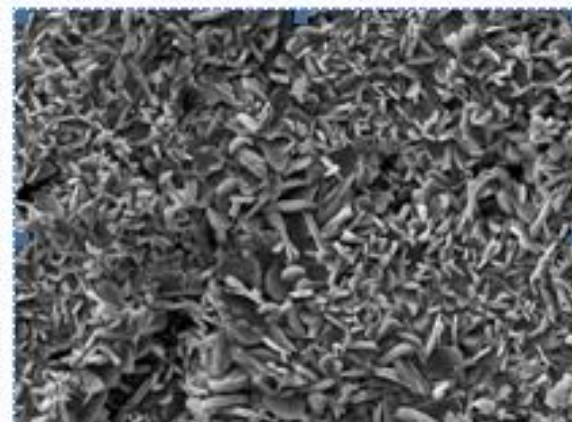
Fosfaatlaag



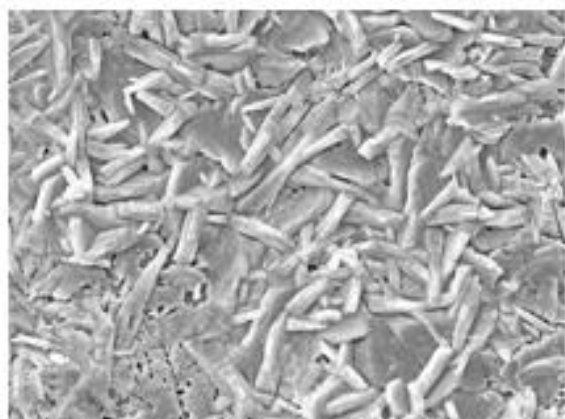
SEM MAG: 2.34 kx DET: SE Detector HV: 20.0 kV DATE: 12/11/09 50 um Vega (T)Tescan
Polynorm, S0907, 08.12.09, SG 3,0 g/m²



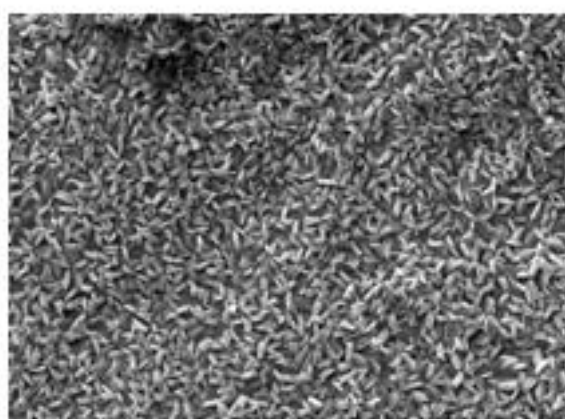
SEM MAG: 2.34 kx DET: SE Detector HV: 20.0 kV DATE: 12/11/09 50 um Vega (T)Tescan
Polynorm, E0823, 08.12.09, SG 2,9 g/m²



SEM MAG: 2.34 kx DET: SE Detector HV: 20.0 kV DATE: 12/11/09 50 um Vega (T)Tescan
Polynorm, G0906, 08.12.09, SG 4,2 g/m²



SEM MAG: 2.34 kx DET: SE Detector HV: 20.0 kV DATE: 12/11/09 50 um Vega (T)Tescan
Polynorm, A0824, 08.12.09, SG 4,0 g/m²



SEM MAG: 2.34 kx DET: SE Detector HV: 20.0 kV DATE: 12/11/09 50 um Vega (T)Tescan
Polynorm, H0904, 08.12.09, SG 2,5 g/m²



Fosfaatlaag OK



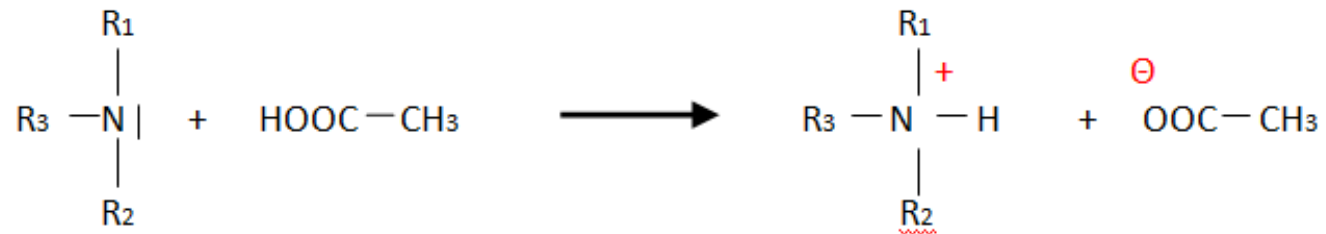
Fosfaatlaag NOK

Wat is Electrocoating

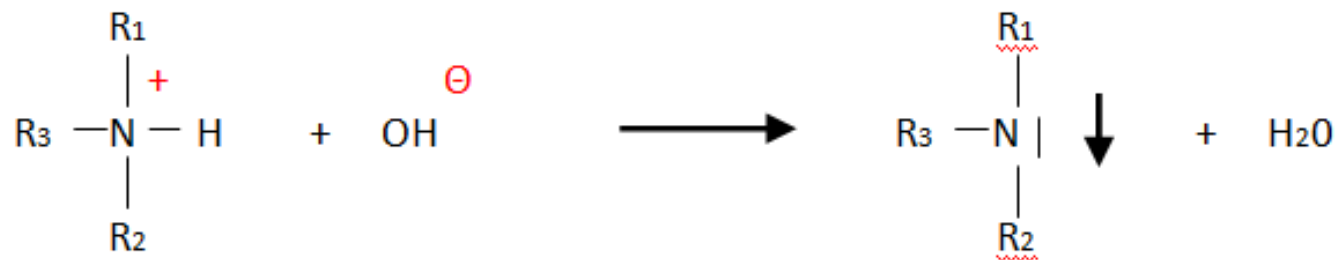
- Electrochemisch lakproces
- Gelijkmatige laagdikte (15 – 25 μm)
- Holle ruimtes worden ook gelakt

KTL

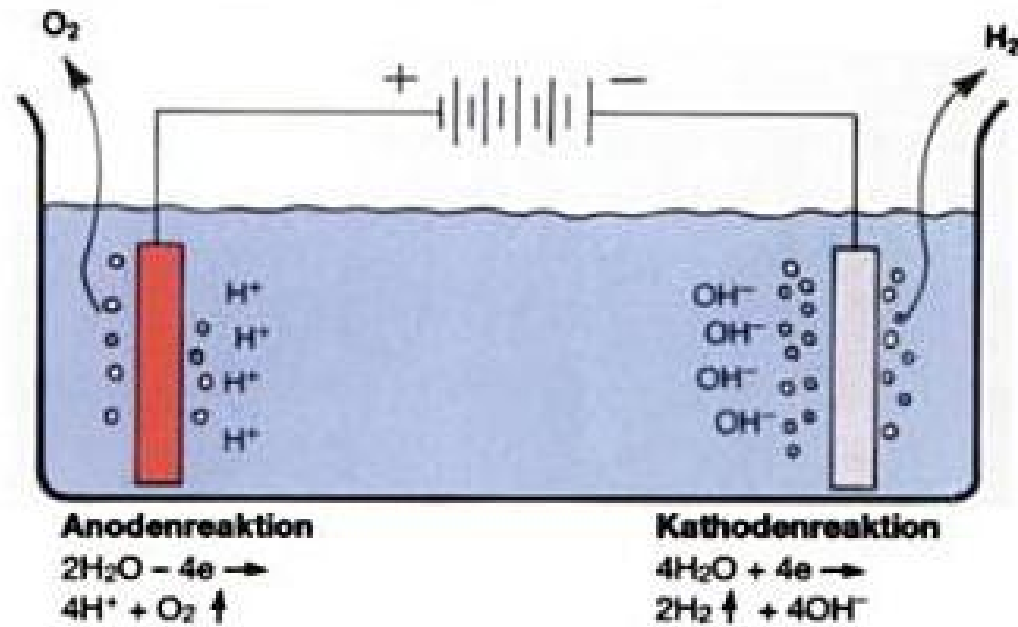
- KTL-bindmiddelen zijn onoplosbare polyamines. Deze worden geneutraliseerd met carbonzuren en vormen een oplosbaar zout.

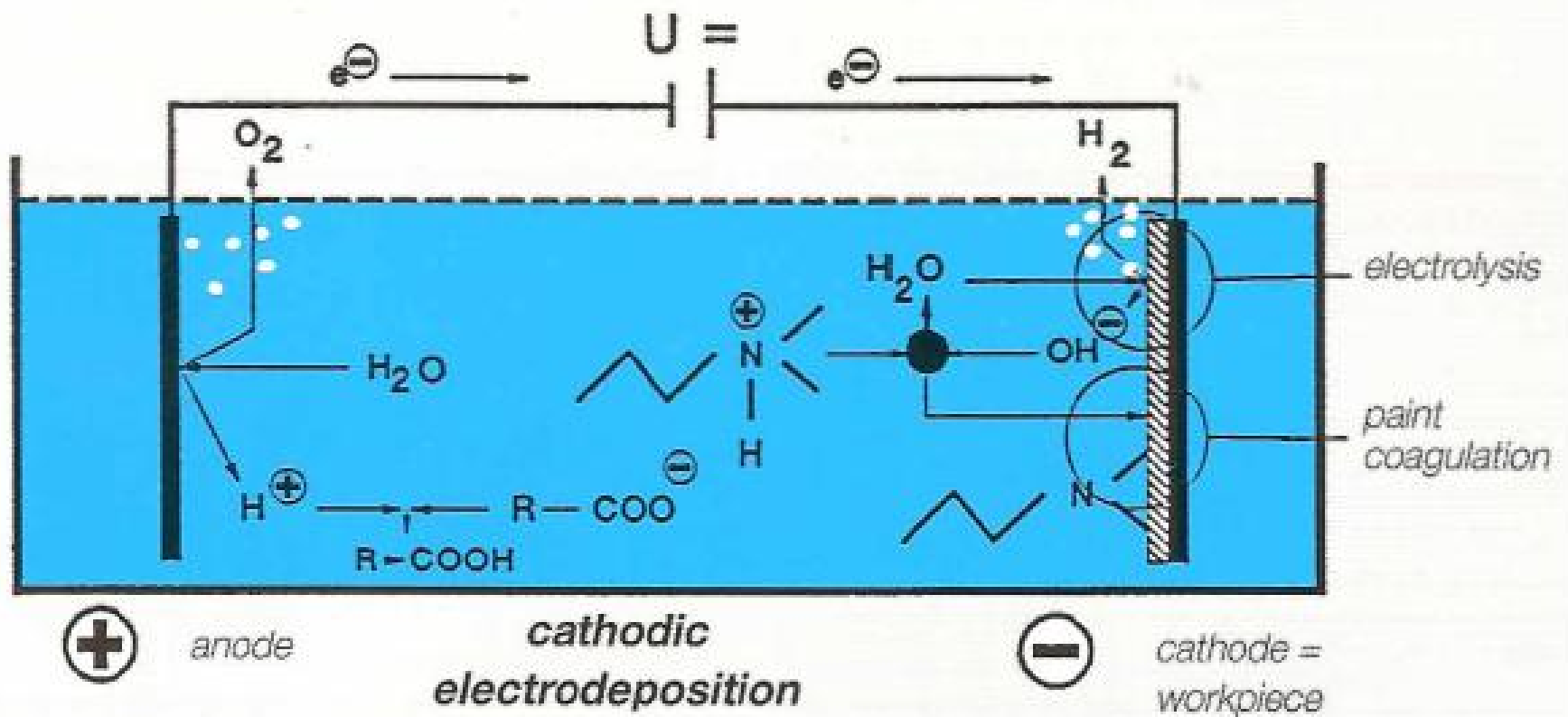


- Dit oplosbaar amine wordt vervolgens in de alkalische grenslaag neergeslagen op het produkt

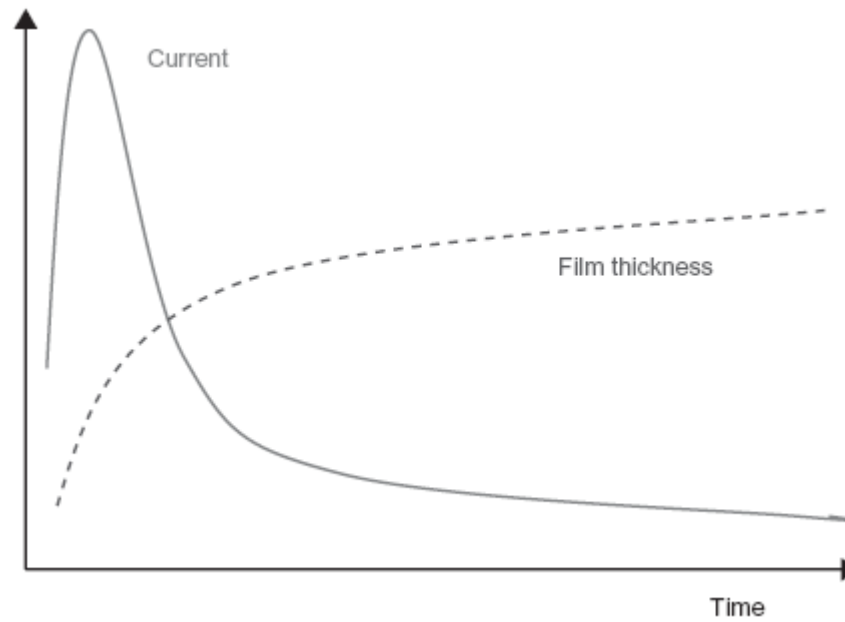


Electrolyse van water

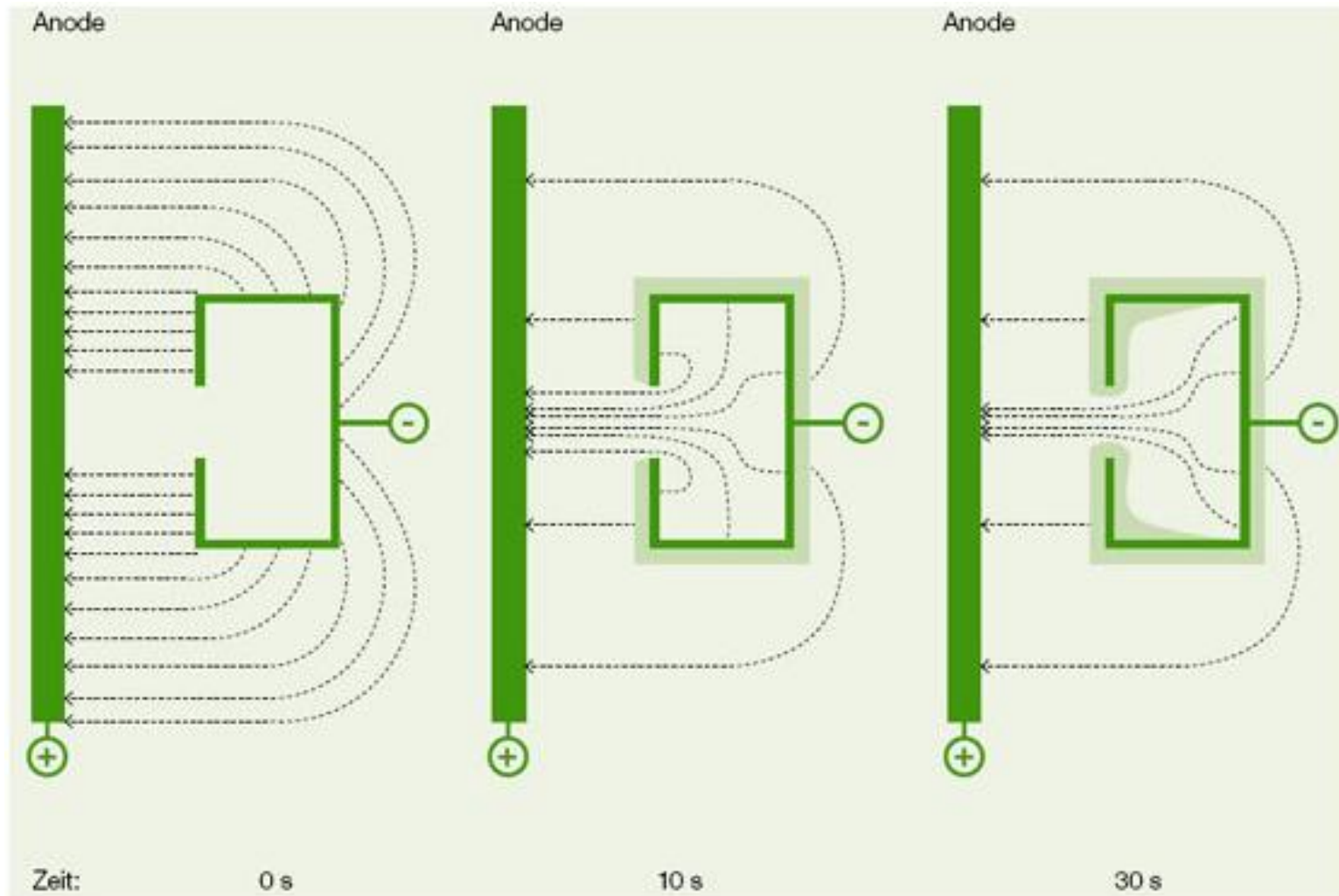




KTL



Umgriff



Rondleiding