Listing & Authorisation

Nickel in surface treatment – Status of Substitution
Conclusions

Brussels, Crown Plaza Le Palace
February 22, 2012

Generic comments

The participants recommend to take into account the following comments for the update of the current draft report:

- *Need to add disclaimer and copyrights to limit the distribution of the report outside industry*
- *Need to include references to the report*
- *Include in the report an explanation on the limitations of the exercise and an estimation of the additional work to do (LCA, Risk Assessment of alternatives, R&D plan…)*
- *Try to gather additional information on LC, Energy consumption, recyclability…*
- *Need to clarify upfront if we speak about Nickel surface treatment technologies or nickel plating technologies and stay consistent throughout the report to avoid confusion.*
- *Summary tables: rethink the entries and ensure that energy will be taken into account under costs but also environment.*
- *Need to summarize in key words when there is or there is no alternative: this must be done more clearly*
- *Need to be careful to develop the right argumentation on why an alternative is not suitable*
- *Take into account the market and the demand, and the difficulty to change the "traditions" in the chapter on "decorative and technical plating".*
- *Underline essential uses of nickel plating in different applications for non-technical persons.*

Technical comments

Automotive

Zinc-Nickel plating discussion

- *The fasteners need to be coupled with aluminium and the report did not take into account the coating with aluminium. Technical issues with the coupling with aluminium to be reviewed. Sealers are needed on the top and you reduce the coupling potential. Zn-Ni less corrosion that with Zn. Dimensional point: 30 micrometer – this gives an issue! The dimension and this is an issue with dip spin coating. Not all the parts can be treated with these systems. For small parts, electrolytic Zn-Ni is far better even. Ni-Zn coupling with aluminium.*
- *Testing Sheradizing: Coventya does not share the results described in the report regarding corrosion. They will share their own information with the consultants.*
- *"Bright nickel Cr on a car": Need to be nuanced in the report and better reflected. Since this issue is handled under the decorative part, this must be clarified upfront.*
- *Miss the engineering point of view which could make an alternative feasible or not: need to be taken into account in the assessment of alternatives.*

Electroless Nickel plating

- *Need to summarize the properties of the electroless nickel at the beginning: different applications and different properties. Combination of properties: important to have the homogeneity of the layer, the cost is critical. Quite low temperature is key. No cleaning afterwards, the roughness remains. The combination with corrosion makes the difference. Good corrosion, wear and no extra finish.*
- *Nikasil under electroless nickel is not relevant: this needs to be included in a different chapter. Alternatives table from nitriding: in ion nitriding looks the same as gaz nitriding, plasma is missing and must be included. This is energy and come back to the carbon print.*
- *Important criteria to be taken into account: light weight material is critical – especially in the future and nickel is a solution. Transmission, fueling system, turbo charges, breaking systems: light metals. Need to get across that this is used as replacement of stainless steel for weight reasons.*

Aerospace

Zinc-nickel

- *Aluminium electroplating (non-aqueous in toluene medium): this alternative is not validated for aerospace but still used in small extend in automotive. (Old patent from Siemens).*
- *For aerospace, it is crucial to to distinguish alternatives in legacy design and new program.*
- *Co is missing in the summary table.*

Electroless nickel plating

- *The consultants will exchange with Mc Dermid about the following issue: Electroless nickel does not offer any cathodic protection like cadmium or zinc-nickel.*
- *Low temperature nitriding: need to clarify the statement of the aerospace on this issue.*
- *HVOF: problem of adhesion - and impossible on aluminium and titanium alloys. Need to be reviewed.*
- *Need to include a statement that there is no alternative for electroless on aluminium*
- *To be checked: p. 22 – steamed turbine in the aerospace industry.*

Decorative plating

Bright chromium electroplating of polymers

- *Replacing nickel plating as a finish or replacing nickel Cr plating? Here focused on electroplating on polymers. If we talk about just replacing nickel: need to take into account the standards such as corrosion standards. None of the alternatives on the screen can meet the automotive requirements: but still need to know why?*
- *If nickel-chrome: color depending of the layer. With the alternatives, the color will not be the same. Important to consider the fact that in the analysis of alternatives, color will not play a role in the analysis.*
- *PVD: this depends on the life-time guarantee. This is a complementary technique, since we need a nickel under layer. The later is not mandatory. Cost efficiency is challenged: expensive and requirements of customers are not fulfilled.*
- *Need to make distinction in decorative between "pure decoration" and where standards need to be followed or technical properties are required.*

Bright chromium electroplating

- *"Cheap nickel": need to be clarified - this means "bad quality".*

- *Main statement: make a clear distinction between technical requirements – can address a number of technics and requirements quoted today but this could be a full report.*

Scope

- *Additional alternatives or end uses to be considered in this report:*
  - *Zn-Ni: the report misses - rubber adhesion. Zn-Ni and after the rubber.*
  - *Use for car body plating – is it still used? Coil coating – some cars in Japan are still coming from Asia.*
  - *This is still use in EU for very specific niche: petrol tanks due to high corrosion of petroleum.*
  - *Electrolytic alternatives: Zn-Iron, hot deposing aluminium, cataphoretic coatings: need to be taken into account in the discussion related to the scope.*
  - *Trication phosphatation: nickel dinitrate – need to be included under automotive*
  - *Nickel electroplating in aerospace: smaller uses to be included*
  - *Electroless: other applications like nickel phosphorus – combination of properties. Several applications: bug turn-over. Nickel PTFE: not in the car industry: all applications except the car industry.*
  - *Electroless nickel on aluminium is missing.*
  - *Cd plating: must be considered in the alternatives in aerospace*
  - *Metal ceramic anti-corrosion (Cermetal) could be considered as an alternative: phosphate, aluminium, high temperature resistance.*
- *Proposals for the scope of a new report:*
  - *Electroforming*
  - *Major lacking end uses/sectors: engineering applications, coinage, others?*
  - *Need to check the existing annex XV on Cr to see what could be relevant.*

Suggested way forward

- *Send written comments (on **automotive** excluding bright chromium applications and **aerospace**) to France: fcapon@nickelinstitute.org by **15 March 2012**.*
- *Updated report on the two previous sectors will be available by **beginning of April.***
- *After internal NI discussions:*
  - *Rework the "decorative and technical" plating in **April 2012***
  - *Identification of the new scope of the next update of the project in June 2012*
- *New updated report: **end of 2012***