Nickel on the Swedish market: a baseline survey of articles in "prolonged contact" with skin.

Anneli Julander, Associate Professor
Work Environment Toxicology, Institute of Environmental Medicine
Karolinska Institutet
Background

- Nickel allergy is still frequent in Europe, North America, and other parts of the world
- Prevalence rates of nickel allergy among dermatitis patients is 12–30%
- Recent study from Sweden the prevalence is 7.5% among 16-yr old general population adolescents (Lagrelius et al Contact Dermatitis 2016:74(1):44-51)
Nickel regulation (former nickel directive)

**Why**
- To protect European public health
- Adopted in 1994
- Fully into force 2001
- Part of REACH since 2009

**Products**
- Intended for direct & prolonged contact

**Compliance**
- Reference test method EN 1811
- 1 week immersion
- Ni release analysis
- 0.5 µg Ni/ cm²/week
- DMG-test
Market surveys: screening for nickel

Market surveys in Sweden have shown that 25% of tested items released nickel before the entry into force of the nickel restriction.

After the restriction this proportion has declined to ~10%, according to follow-up studies.
ECHA definition April 2014

‘potentially more than 10 min on three or more occasions within 2 weeks, or 30 min on one or more occasions within 2 weeks’

No studies of new type of items that conform to this definition
New market survey

Objective: To establish a baseline of nickel-releasing items on the Swedish market conforming with the EU nickel restriction according to the definition of ‘prolonged contact’ with the skin.

Categories that have not previously been tested extensively for nickel release. Metallic appearance in contact with skin.

- Accessories - bags, wallets, and umbrellas
- Electronic devices - laptop computers, activity bracelets, and computer mice
- Utensils - needlework, painting, and writing

Ringborg et al Contact Dermatitis 2016:75(2): 77-81
Nickel spot test (DMG-test)

- Dimethylglyoxime (DMG) and ammonia
- Rub item for 30 seconds
- Pink colour - nickel release at a level of 0.5µg/cm²/week

DMG (dimethylglyoxime) test: \( \text{Ni}^{2+} + \text{DMG} + \text{NH}_3 \rightarrow \text{Ni}^{2+} \)
Results

Tested in total 141 articles in 261 different spots

- **Utensils**: 54% pos
- **Accessories**: 21% pos
- **Electronic devices**: 48% pos

- Ringborg et al Contact Dermatitis 2016:75(2): 77-81
Conclusions

The high proportion of DMG test positive items indicates that there is still much work to be done to reduce the nickel exposure of the population.

The large proportion of nickel releasing items in the present study shows clearly that broader parts of industry need to take action to prevent nickel allergy.

We still need to better understand the contribution of many diffuse contacts with nickel releasing items in relation to contact allergy and dermatitis.
Thank you for your attention!

Anneli Julander, Associated Professor
Anneli.julander@ki.se