

Replacement of materials and chemicals in Rapala VMC

- Rapala VMC
 - Lures
 - Fishing hooks
 - Knives
 - Skis
 - Fishing line
 - Baits
 - etc
- Dangerous materials
 - Employee safety
 - Customer safety
- Restricted materials
- Outdated/discontinued materials



Lead

- Toxic, bioaccumulative
- Amount of lead weights introduced to water¹:
 - 97-170 tons, Denmark (before ban)
 - ~660 tons, Germany
 - 1000 tons, Poland
- Direction towards lead ban visible from 2001, starting from Denmark
 - Evident that the severity/range of the ban will increase
 - Work and research starts



Lead use in Rapala

- ~18 – 24 tons of lead per year (2000s)
 - 12-16M products

Products that needed redesign due to material change

- 85% lead-free by 2015

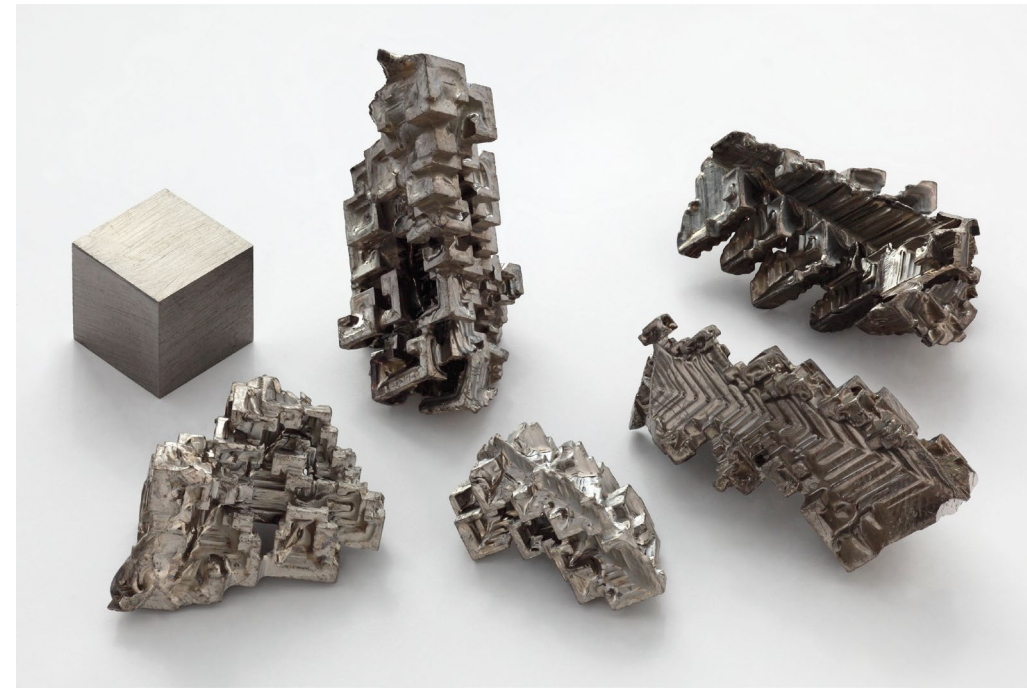
Products where redesign was not an option

- 93% lead-free by end of 2022
- Still a few products where replacement process is ongoing



Lead replacement

- Map materials with similar critical properties
 - Density
 - Hardness
 - Melting point
 - Price / Availability
 - Potential toxicity / danger for future regulation / restriction
- Proof of concept-samples with the most promising candidates
- Rigorous quality testing **until end-use tests**
- Small scale testing with existing machinery / production process
- Large scale production tests, large scale quality tests
- Slow, step-by-step introduction to the product range



Lead replacement

- Die casting / injection molding
 - 9 different substitutes
 - 4 – 90 €/kg
- Prefabricated components
 - 10 articles
 - 3 – 120€/kg
- Changes in processing equipment
 - Molds
 - Jigs
 - Blades
 - Redesign of components
 - Redesign of products



Chemical management

- Full database of chemicals and materials
 - Full list of SDS
 - Stay up-to-date on changing regulations
- Automatic identification of restricted chemicals according to SDS
 - Depending on number of chemicals used, could be done manually
- Continuous cooperation with suppliers, internal research when possible

- Proof of concept-samples with the most promising candidates
- Rigorous quality testing **until end-use tests**
- Small scale testing with existing production process
- Large scale production tests, large scale quality tests
- Slow, step-by-step introduction to the product range



Conclusions

- Eye in the future – what is the direction, which chemicals could be „in danger“
 - Can some be switched for safer alternatives even before danger of regulation?
- Good overview of existing materials and chemicals, where they are used, for what purpose
- Reduce the number of different chemicals used, if possible