

VAN PEPPERZEEL

NON-FERRO METALEN / BATTERIJ-RECYCLING



Used Lithium Batteries Collection Brussels 31-8 and 1-9 2010

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Van Peperzeel B.V.

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the Batteries now

Types of batteries

- Portable batteries
- Industrial batteries
- Batteries from WEEE-scrap



Industrial batteries



- Ni-Cd/Ni-Mh batteries with KOH
- Lead acid batteries



- Lithium-Ion batteries



Sorting plant in the Netherlands



Nickel Metalhydride (power) types

- Successor of the NiCd batteries
 - Same applications as NiCd batteries
 - Better future because the ban on NiCd cells
 - Used in new markets like hybride cars and bicycles



Standard Lithium types

- Consumer types
- Present situation regarding Lithium batteries



Standard Lithium types

- Industrial / military types
- Safety regulations are very important



Standard Lithium types

- Li-ion batteries from Laptops, etc.
- Li-polymer and Lithium power batteries



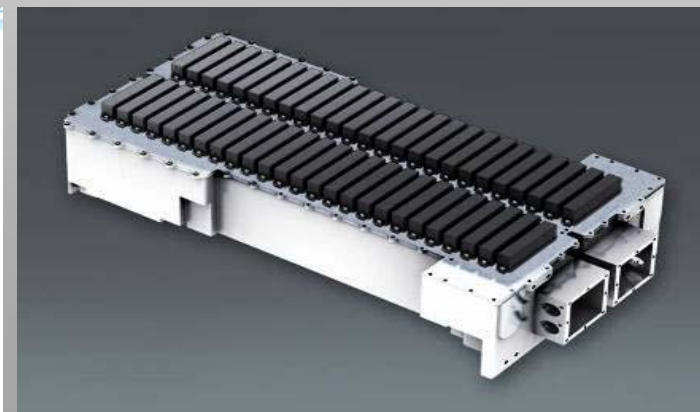
Standard Lithium types

- Standard technology
- Well identifiable battery types
- Proven recycling solutions are available
- Standard accepted logistic procedures/ADR/UNECE



Lithium power types

- Many different (new) types
- Great variety in substances and materials



Lithium power batteries contain:



| Cathode materials | System code Asia |
|---|------------------|
| LiCoO_2 | LCO |
| $\text{Li Ni}_{0,8} \text{Co}_{0,15} \text{Al}_{0,05} \text{O}_2$ | NCA |
| LiMn_2O_4 | LMO |
| $\text{LiNi}_{1/3}\text{Mn}_{1/3}\text{Co}_{1/3}\text{O}_2$ | NMC |
| LiFePO_4 | LFP |

Carriage of used batteries

- Transport of collected used mixed batteries (all ADR class 9)
- Transport of sorted fractions
 - Notifications (only for NiCd-, Pb-, and Hg containing batteries)
 - Regulations (ADR, UN, National, Local)
 - Lithium batteries (ADR class 9, package group II, max.450 kg)
 - In the Netherlands use of drums (60/80/120/220 liter)



Carriage of used batteries

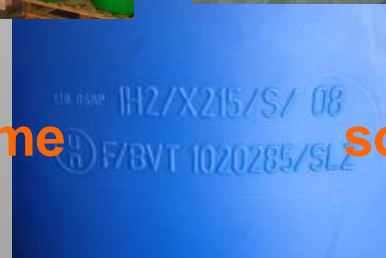
- Some pictures to explain the near past and the present time



• Past situation

present time

sorted Lithium batt.



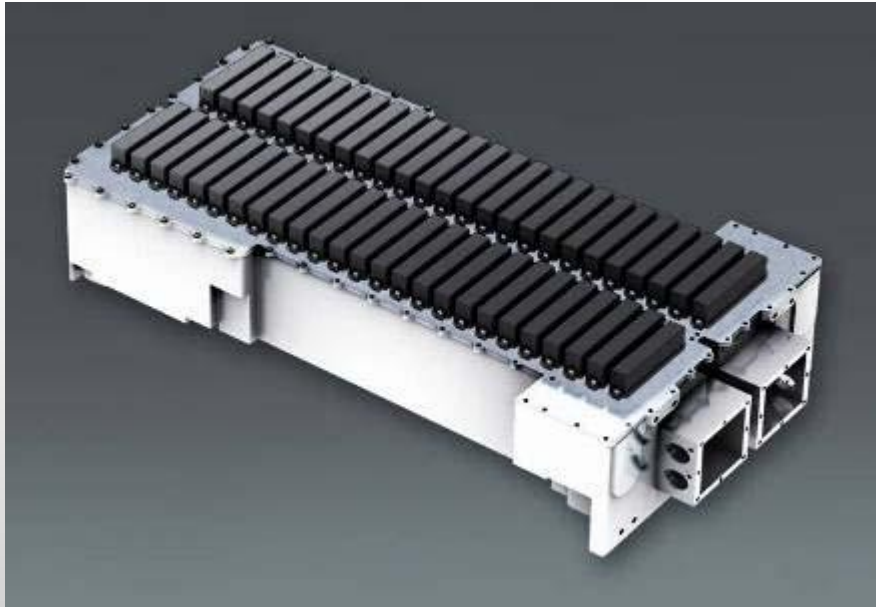
Recommendation



- In conclusion, more cooperation between producers and recyclers of (power) batteries is absolutely necessary for handling used lithium batteries returned from e-mobility

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Questions ??

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