

Residual fraction of municipal waste

Usage of Stabilat® in Lägerdorf cement plant

International Experts Seminar
in Sevilla, June 2010

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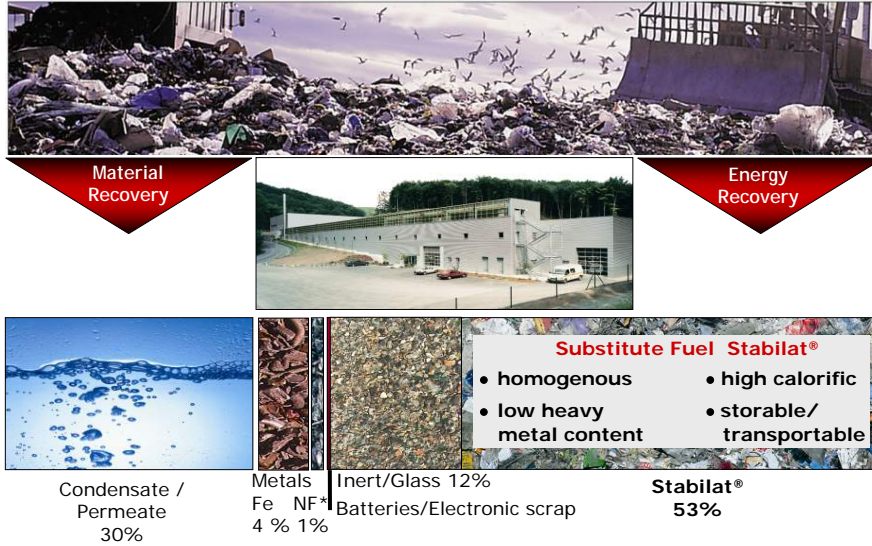


Content

- Using MSW as a resource
- Flowchart Stabilat® Technology
- Increase of calorific value
- Composition of Stabilat®
- Ternary system
- Specification
- Stabilat® - Fluff and Pellets
- Lägerdorf plant - process
- Lägerdorf plant – kiln 11



Using MSW as a resource



3

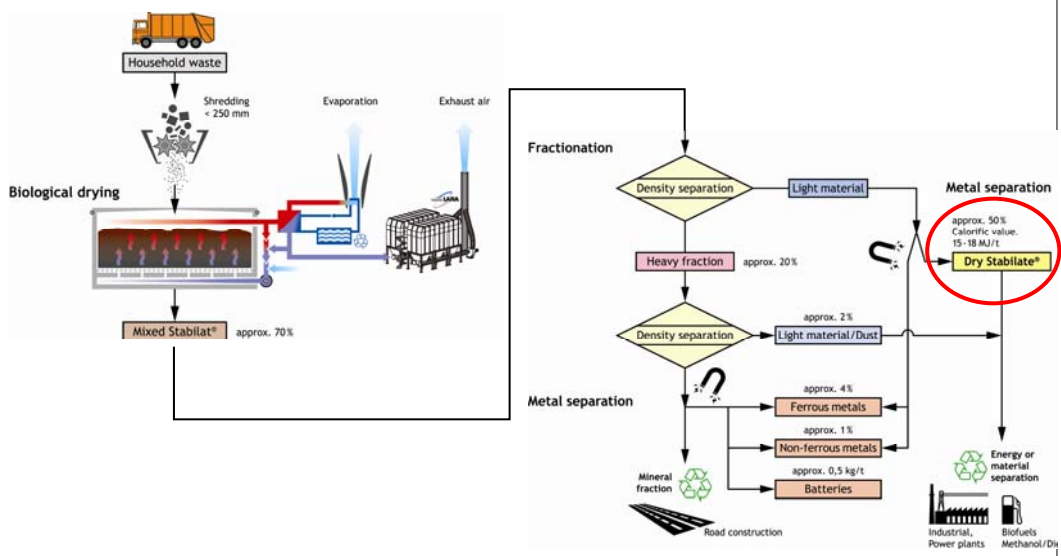
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Flowchart Stabilat® Technology



4

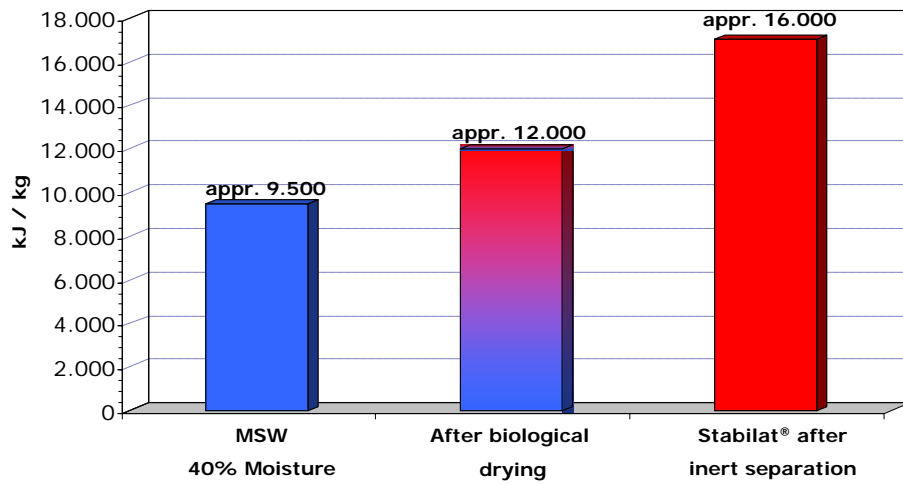
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Increase of calorific value



5

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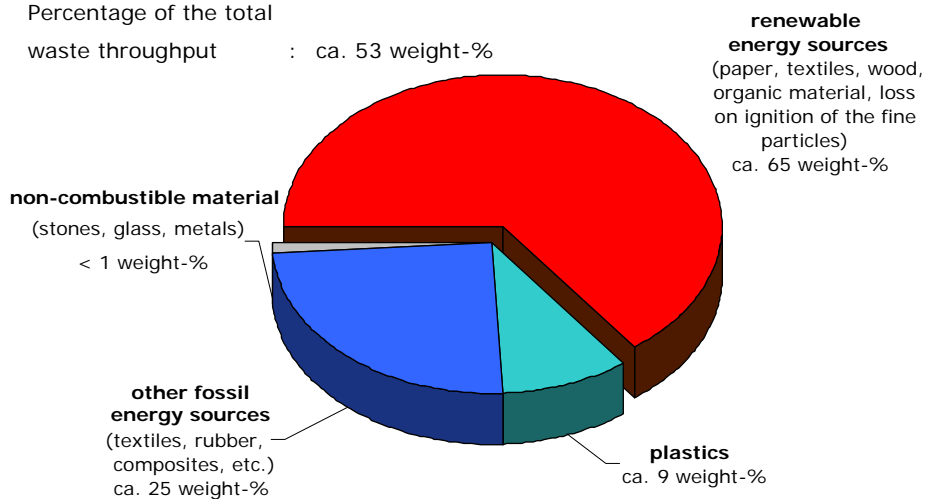
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Composition of Stabilat®

Heating value : 15 - 18 MJ/kg
 Water content : ca. 15 weight-%
 Percentage of the total waste throughput : ca. 53 weight-%



6

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Stabilat® - Fluff and Pellets

material

- › Usage of soft – pelletized material at Lägerdorf plant (calciner)
- › Best results by material transfer
- › Minimized dust formation
- › Size: < 30 mm
- › H_U : 15 – 18 MJ/kg



Fluff



Hard-Pellets

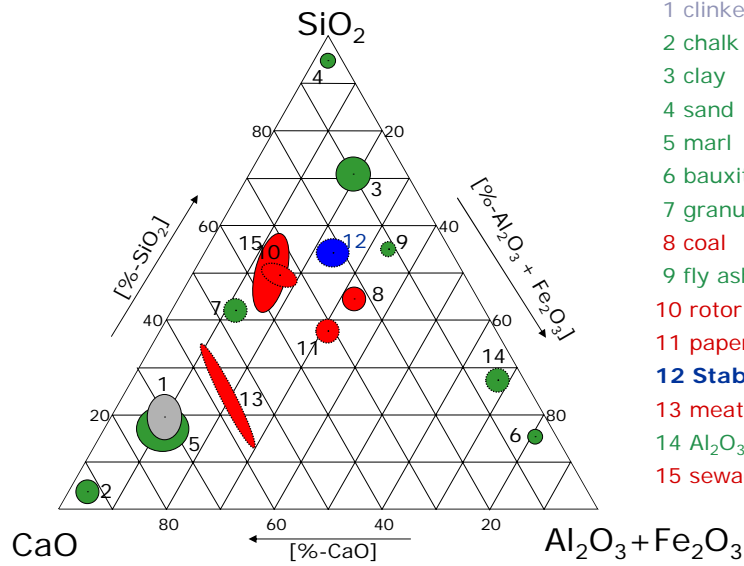


Soft-Pellets

Specification

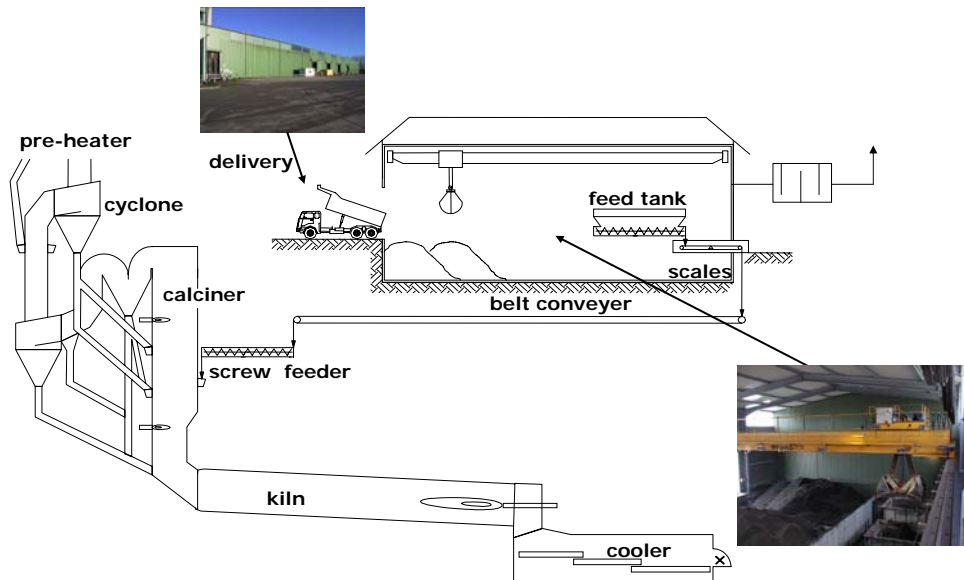
| Parameter | Unit | Median | Limits |
|-------------------|----------------|--------|--------|
| calorific value | kJ/kg | 15.000 | > 13 |
| moisture | % | 15 | < 30 |
| ash content | % TS | 15,0 | 25,0 |
| chlorine | % TS | 0,7 | 1 |
| schwefel | % TS | | 0,5 |
| mercury | mg/kg TS | | 0,7 |
| cadmium, thallium | mg/kg TS | | 5 |
| arsenic | mg/kg TS | | 20 |
| lead | mg/kg TS | | 200 |
| chromate | mg/kg TS | | 300 |
| cobalt | mg/kg TS | | 25 |
| copper | mg/kg TS | | 400 |
| manganese | mg/kg TS | | 500 |
| nickel | mg/kg TS | | 160 |
| vanadium | mg/kg TS | | 25 |
| PCB / PCDF/ PCDD | Ug I-TEQ/kg OS | | 10 |

Ternary system

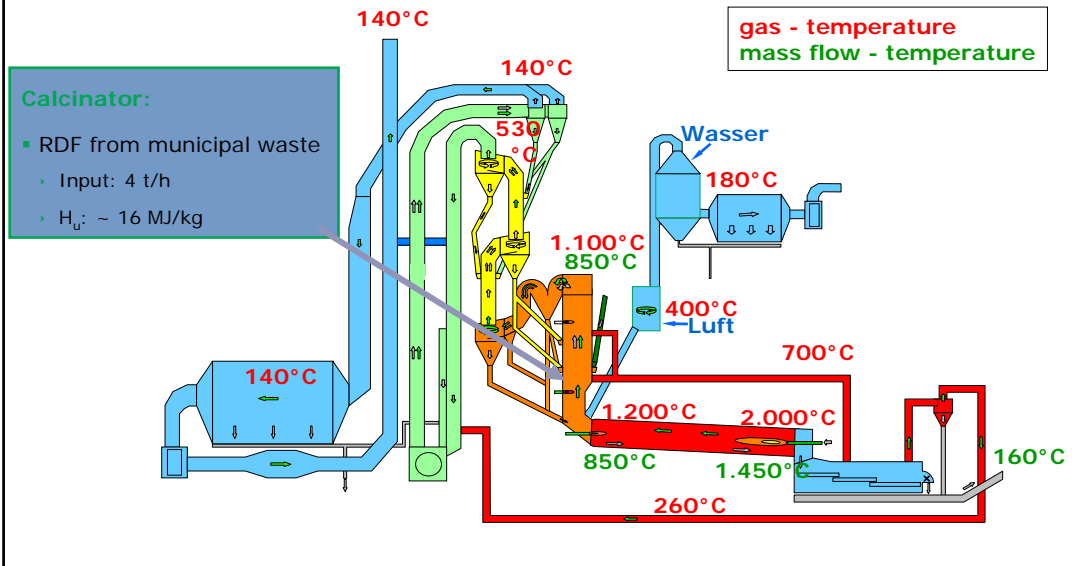


- 1 clinker
- 2 chalk
- 3 clay
- 4 sand
- 5 marl
- 6 bauxite
- 7 granulated MIC
- 8 coal
- 9 fly ash
- 10 rotor blades
- 11 paper sludge
- 12 Stabilat®
- 13 meat and bone meal
- 14 Al₂O₃-sludge
- 15 sewage sludge

Lägerdorf plant - process



Lägerdorf plant - kiln 11



11

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Conclusion

- Diversion from landfill = ~ 87% of the preparation plant's MSW input
- ~ 13% can be reused e.g. in road construction or has to be landfilled
- almost 100% of the organic fraction is contained in the recovered RDF (→ diverted from the inert fraction and in turn from landfill)
- complete recovery of Stabilat® in terms of material and energy in the Lägerdorf cement plant

12

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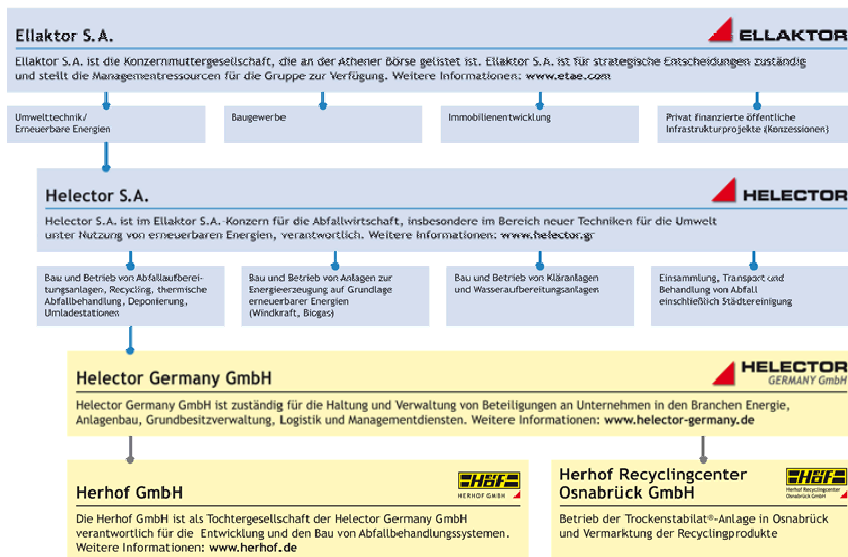
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Extra Charts

Organization chart



Use of Outputs

- Stabilat® → Cement plants, Power plants
- Ferrous metals → Existing metal recycling applications
- Non-ferrous metals → Existing metal recycling applications
- Batteries → Other ways of disposal
- Inert fraction → landfilled or used in road construction

Climate effective CO₂-emissions

- Comparison of fossil energy sources with Stabilat® -

| energy source | Overall CO ₂ emission factor | heat value | specific Overall-CO ₂ emissions | regenerative energy contingent | specific fossil CO ₂ emissions | fossil CO ₂ emission factor |
|---------------|---|------------|--|--------------------------------------|---|--|
| | g CO ₂ /MJ | MJ/kg | g CO ₂ /kg | %-energy contingent | g CO ₂ /kg | g CO ₂ /MJ |
| brown coal | 111 | 8,6 | 955 | 0% | 955 | 111 |
| hard coal | 93 | 29,7 | 2.762 | 0% | 2.762 | 93 |
| fuel oil | 74 | 35,4 | 2.620 | 0% | 2.620 | 74 |
| natural gas | 56 | 31,7 | 1.775 | 0% | 1.775 | 56 |
| Stabilat® | 71 | 15 | 1.067 | 66,8% | 354 | 24 |