

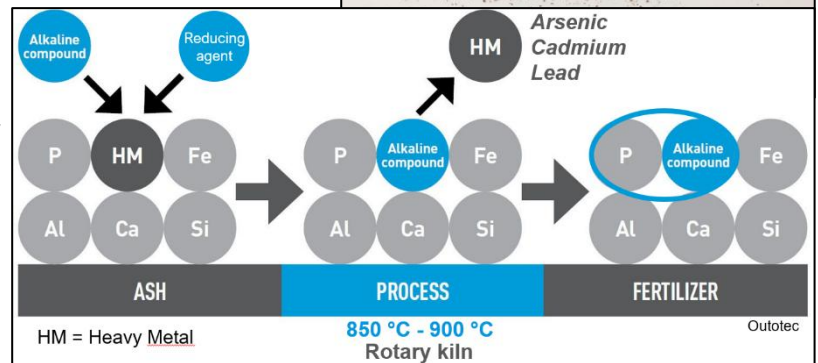
Technology for P recovery as biomass ashes from low plant available phosphorus compounds with "AshDec[®]" thermochemical process



Keywords: • Sewage sludge Ash • thermochemical conversion • plant available phosphorus

Key facts:

- **Technology category:** Thermochemical nutrient recovery
- **Input material:**
 - Sewage sludge ash
 - Sewage sludge (optional)
 - Sodium carbonate
- **Output material:** Calcined ash with 15-25 % P₂O₅)
- **Capacity:** Plants should exceed a capacity of 15.000 t per year
 - 1 t of input ash ≈ 1 t of product
- **Focusing geographical areas:** EU28
- **Technology status:** TRL7
- **EC/MS Authority permits:** Patent number: DE 10 2014 108 199.4



Summary of the technology:

AshDec[®] is a thermochemical process designed to convert the low plant available phosphorus compound in the ash (Ca₃(PO₄)₂) to the highly plant available compound CaNaPO₄ while reducing the heavy metal content. The core process encompasses feeding ash to a rotary kiln where it is mixed with sodium compounds (e.g. Na₂CO₃) and a reducing agent, preferably sewage sludge. The material is treated at around 900 °C for 15-20 min. Sodium ions replace calcium ions in the phosphates and form citrate-soluble CaNaPO₄ compounds. Simultaneously, sodium reacts with silicon dioxide present in the ash and forms sodium silicates. As reducing agent, preferably sewage sludge is added to reduce the oxidized heavy metals. A noticeable high amount of heavy metals in their elemental form evaporate at the prevalent temperatures.

Competitive position and advantages:

- The AshDec process is a robust technology to convert low plant available phosphorus compounds in biomass ashes (e.g. sewage sludge ash) to highly plant available phosphorus compounds
- The product has a low content of contaminants, e.g. heavy metals (Cd, U, As, Pb), no organic compounds and is free of pathogens
- P-Recovery rate > 95 %
- No hazardous input/output material
- No to very little amounts of residues, no by-products

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