



Splitting of Tailings in the AWZ Halbenrain

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1. Summary

The future practise of waste disposal will, in the near future, be subjected to considerable modifications by the change of the legal basic conditions for putting waste on the landfill and industrial waste incineration in Austria and in the EU. As for putting waste on the landfill, the stipulations specified by the action plan for putting waste on the landfill are applicable (Landfill Regulation, Amending Statute to Water Right, Amending Statute to the Law regulating the Sanitation of Landfills and Abandoned Polluted Areas). In this context, it should be noted that the Landfill Regulation will, from 2004 (2009), prohibit putting waste that fails to meet certain criteria (here the criteria for TOC, ignition loss and the calorific value are particularly relevant) on the landfill.

The Pilot Project "Restabfallsplitting bzw. **Mechanisch-Biologische Restabfallbehandlung vor der Verbrennung (MBRVV) im Abfallwirtschaftszentrum Halbenrain**" ("Splitting of tailings or Mechanical-Biological Treatment of Tailings prior to the Incineration in the Waste Management Centre Halbenrain) was aimed at closing the gaps in knowledge of the mechanical-biological treatment of tailings, in particular in terms of the mechanical-biological pretreatment of commercial waste. Whereas the mechanical-biological treatment of tailings according to the final rotting process tries to decompose the carbon contained in waste as far as possible in order to make it possible to securely put waste on the landfill afterwards, the mechanical-biological treatment of tailings prior to incineration strives at preserving carbon as far as possible.

At the tests, the water content could be reduced by appr. 5 to 20 % (maximum value: 47 %) and the calorific value could be increased by appr. 20 to 30 % (maximum value: 58 %). The pollutant content of the substances subjected to dry stabilisation (dry stabilisate) had the level of that of mixed coal or was below this level for most elements. Subsequent laboratory tests helped to show that an optimised screening (water content < 15 M-%) could contribute to eliminating pollutants. The target of reducing the water content to 15 M-% within a treatment period of 7 to 10 days could not be achieved because there were deficits relating to plant technology.

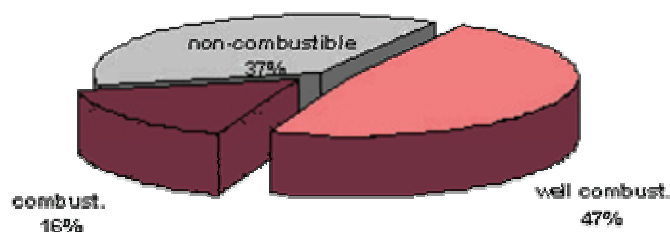
Furthermore, a mechanical-biological pretreatment prior to the incineration of the delivered waste does not seem very useful in view of the properties of waste (low share of substances that are biologically decomposable). A mechanical-biological treatment of individual types of waste can only be advantageous when it comes to putting waste on the landfill (less gravitational water, saving in the sense of the AISAG (Altlastensanierungsgesetz - Law regulating the Sanitation of Abandoned Polluted Areas). Nevertheless, this will only be possible until 2004 (2009). On the other hand, a mechanical pretreatment of commercial waste must be classified as being very useful in view of the resulting increase in calorific value, the separation of inert materials as well as the elimination of pollutants.

2. Starting Position

The major part of waste in Styria still is directly taken to the landfill (1996: 89 %). At the moment no commercial tailings are subjected to a thermal treatment in Styria. The practise of waste disposal in the AWZ (Abfallwirtschaftszentrum - Waste Management Centre) Halbenrain can be compared to the overall situation in Styria quite well. Appr. 71.300 Mg/a of the overall amount of 80.700 Mg/a are directly put on the landfill.

The waste delivered to the AWZ Halbenrain primarily is formed by commercial and industrial waste. The waste belonging to the waste category "household waste and commercial waste resembling household waste" has been analysed in terms of the materials contained by sorting. These analyses have shown that the major part of these shares is combustible or well combustible while only 12 M-% can be classified as being easy to rot ("green pie").

Combustibility of commercial waste resembling household w.: AWZ (data in M-% HS)



Biological decomposability of commercial waste resembling household waste in the AWZ Halbenrain (data in M-% HS)

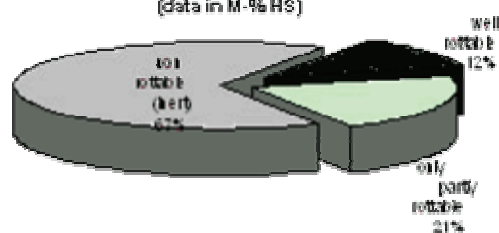


Figure 1-1: Combustibility/Rottability Code No. 91101



3. Goals

The Pilot Project "Restabfallsplitting bzw. **Mechanisch-Biologische Restabfallbehandlung vor der Verbrennung** (MBRVV) im Abfallwirtschaftszentrum Halbenrain" ("Splitting of tailings or Mechanical-Biological Treatment of Tailings prior to the Incineration in the Waste Management Centre Halbenrain") was aimed at closing the gaps in knowledge of the mechanical-biological treatment of tailings, in particular in terms of the mechanical-biological pretreatment of commercial waste. Whereas the mechanical-biological treatment of tailings according to the final rotting process tries to decompose the carbon contained in waste as far as possible in order to make it possible to securely put waste on the landfill afterwards, the mechanical-biological treatment of tailings prior to incineration strives at preserving carbon as far as possible.

Furthermore, waste is to be made accessible to thermal use by being processed. The processing steps are focused on improving the properties of the residual materials/waste to be used in terms of the materials contained (separating inert materials), the physical properties (increasing the calorific value, reducing the water content) and chemical properties (eliminating pollutants).



4. Procedure

In the first phase of the Pilot Project, the delivered waste was analysed chemically and physically. This analysis showed that some waste categories would be well suited for thermal use. In the second phase of the Pilot Project, large-scale tests relating to the dry stabilisation of commercial and industrial waste were made. In the first test series, a compound between the waste categories "household waste and commercial waste resembling household waste" and "sewage sludge stabilised in an anaerobic way" was subjected to a mechanical-biological treatment. In a second test series, a compound between the waste categories "residues from waste paper processing" and "sewage sludge stabilised in an anaerobic way" was subjected to a mechanical-biological treatment.

Process chart showing the tests rel. to dry stabilisation tests

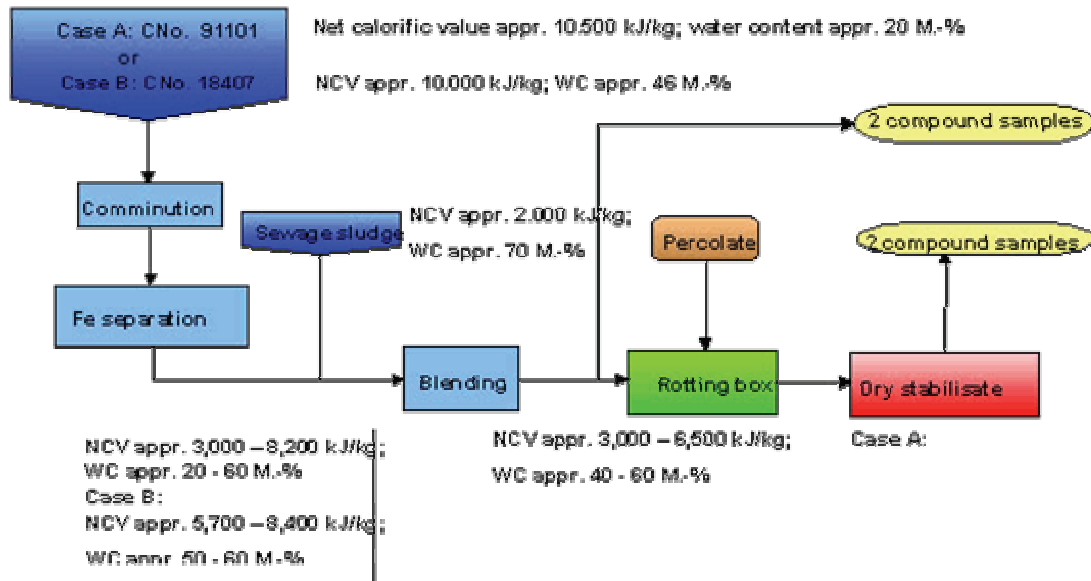


Figure 1-2 Sequence of the tests relating to dry stabilisation (Code No. 91101 (household waste) ; Code No. 18407 (residues waste paper processing))

5. Result / Benefits

At the tests, the water content could be reduced by appr. 5 to 20 % (maximum value: 47 %) and the calorific value could be increased by appr. 20 to 30 % (maximum value: 58 %). The pollutant content of the substances subjected to dry stabilisation (dry stabilisate) had the level of that of mixed coal or was below for most elements. Mixed coal has a higher content of the elements As, V and TI whereas the Pb, Cr, Cu, Ni and Zn load of the substances subjected to dry stabilisation (dry stabilisate) is higher. The dry stabilisate of the second test series, however, had a pollutant potential that was much lower than that of the first test series. Subsequent laboratory tests helped to show that an optimised screening (water content < 15 M-%) could contribute to eliminating pollutants.

The target of reducing the water content to 15 M-% within a treatment period of 7 to 10 days could not be achieved because of the above mentioned deficits of the plants and units available at the site.

Furthermore, a mechanical-biological pretreatment prior to the incineration of the delivered waste does not seem very useful in view of the properties of waste (low share of substances that are biologically decomposable). A mechanical-biological treatment of individual types of waste can only be advantageous when it comes to putting waste on the landfill (less gravitational water, saving in the sense of the AISAG (Altlastensanierungsgesetz - Law regulating the Sanitation of Abandoned Polluted Areas). Nevertheless, this will only be possible until 2004 (2009). On the other hand, a mechanical pretreatment of commercial waste must be classified as being very useful in view of the resulting increase in calorific value, the separation of inert materials as well as the elimination of pollutants.