sardinia_2019 17th INTERNATIONAL WASTE MANAGEMENT AND LANDFILL SYMPOSIUM / 30 SEPT - 04 OCT 2019 Forte Village / Santa Margherita di Pula (CA) / Italy

UTILIZATION OF PRIMARY SIEVED SOLIDS FOR GASIFICATION AND ENERGY PRODUCTION

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ABSTRACT: Microsieving is a new promising process for the removal of suspended solids, upfront of the aeration tank. Microsieving, removes selectively the larger suspended particles from wastewater, thus reducing further the requirements for aeration in the biological treatment tank. The biosolids produced by the microsieve are commonly called Primary Sieved Solids (PSS). They have solids content of about 39.5±4%, while the percentage of volatile solids on a dry basis are about 83.5%±1%, both of which are significantly higher compared to other types of biosolids. Moreover, the Higher Heating Value (HHV) of PSS has been measured as 23±0.7 MJ/kg, which is considerably higher not only from all other types of biosolids, but also of a number of solid fuels, such as lignite and wood. The low moisture content and high HHV of PSS make them ideal feedstock for gasification. The present study assesses the effect of microsieving on municipal wastewater treatment, the examines the characteristics of the produced PSS and their potential as gasification feedstock. An integrated microsieving-drying-gasification plant with wastewater treatment capacity of 5000m^3/d, and PSS production and gasification capacity of about 1 ton/d PSS is currently under construction at the municipal wastewater treatment plant of Rethymno, Greece. The plant will be operated on a 24h operation basis, and it is expected to produce between 1800-2400 Nm^3 syngas per day.

Keywords: wastewater treatment plant; microsieve; gasification; biosolids management; primary sieved solids; waste to energy.

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