

Extended Abstract

Steam-Based System Design for SMW Treatment [†]

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1. Introduction

Solid municipal waste (SMW) represents an environmental problem largely distributed all around the world that requires urgent management actions. Extensive studies have been performed and dedicated management measures optimized depending on the country's regulation and specificities [1]. Integrated multistep procedures that involve mechanical, thermochemical, and biochemical processes are being developed to increase as much as possible both mass and thermal efficiency [2]. Within the CleanTech Project, funded under the frame of POC 2014–2020 Structural Funds Programme, clean technologies for combustible materials are being developed. For this purpose, a thermochemical process using under-pressure solid matter concentration was considered. To do that, the first step was to design a reactor in which an adapted hydrothermal treatment would be optimized.

2. Materials and Methods

For this study, a mathematical model in ANSYS was built to design a reactor for SMW processing. In addition, on several samples of SMW, immediate and ultimate analyses were performed to ensure the input for mathematical simulation.

3. Results

Based on the technical characteristics imposed by the technical data sheets of the installation components, the reactor design calculations were performed using ANSYS engineering simulation program. In Figure 1, two sections of the designed reactor are presented.

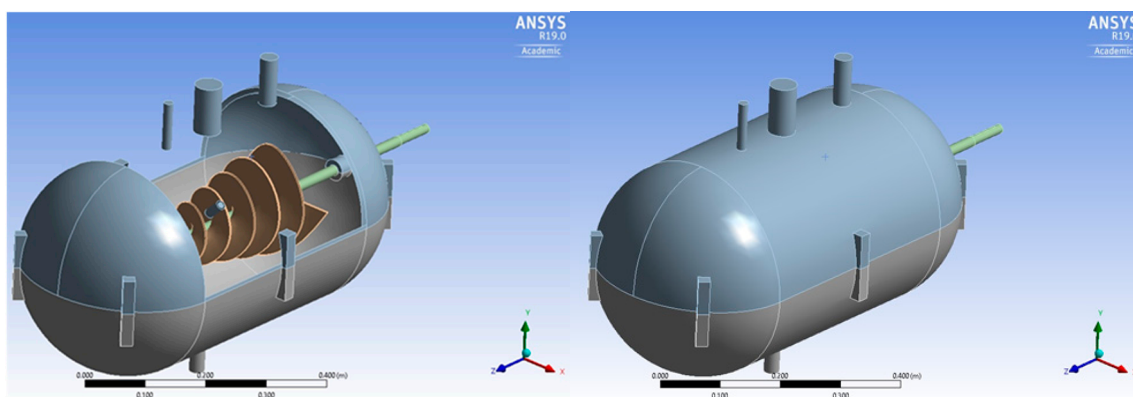


Figure 1. Section of designed reactor for MSW steam-based treatment.

4. Conclusions

By applying the mathematical simulation in ANSYS, reactors for SMW treatment with pressured steam can be designed to operate in secure conditions for the given technical characteristics of the components.

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