Methods and tools for reliable design of equipment in waste-to-energy units

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Abstract

Waste-to-energy (WtE) units represent specific technologies that process problematic raw materials (i.e., wastes) and deal with equally problematic products such as flue gasses or solid residues (these often induce fouling and are considerable pollutants). Reliable design of apparatuses which in the respective units carry out the actual waste processing and energy recovery must, therefore, utilize suitable, up-to-date methods and tools while these must, in turn, be able to take into account all the relevant and necessary factors.

Through an industrial example, the paper presents new trends in equipment design for up-to-date WtE units and new design methods and calculation tools which the authors have been developing to ensure high design accuracy and operating reliability of such new equipment.

The developed methods and tools employed within the complex design framework are unique and beneficial in the sense that they have been based not only on theoretical knowledge but also on practical knowledge and experience in designing of the respective non-standard process equipment. Moreover, it is also clearly shown that the corresponding methods and tools can be efficiently used in case of both the design of equipment intended for new WtE units as well as troubleshooting of equipment in units which are already being operated.