

EXPERIMENTAL ANALYSIS OF MINIMUM IGNITION TEMPERATURE OF SELECTED BIOMASSES

Medic Pejic, L.¹, Larrad-Moreno M.¹, García Torrent, J.^{1,2}, Castells Somoza, B.¹

1. Department of Energy and Fuels (UPM Technical University of Madrid, Spain), C/ Alenza 4, 28003 Madrid, Spain

2. Laboratorio Oficial Madariaga, LOM (UPM Technical University of Madrid, Spain), C/ Eric Kandel, 1 e (TECNOGETAFE), Parque Científico y Tecnológico de la UPM, 28906 Getafe, Madrid, Spain

Abstract

The paper presents an analysis of the minimum ignition temperature (MIT) of dust layer when is influenced by common parameters as particle size, layer thickness or compaction of the samples and the dependence between flammability and ignition temperatures values of selected biomass.

Tests were performed in accordance with European standard EN 50281-2-1 to determine the minimum ignition temperature for 5, 25 and 50 mm high dust layer.

Three groups of different biomass commercially available were used, two samples among them are wheat straw and two woodchips with different particle sizes. The remaining two samples represent the thermally dried sewage sludge.

The most significant results are shown on the graph below, where compaction has been studied in order to see if and how compaction is affecting the minimum ignition temperature. The MIT values change in the most striking way with the sample sizes and with the layer thicknesses. That is, by increasing the layer thickness, reduce the minimum ignition temperature in the layer. This also happens with samples of coarse granulometry; however the difference is not so significant.

The results obtained for the 50 mm layer are not influenced by the compaction for both fine and coarse grain size samples. Coarse samples do not significantly compact, so it does not vary their density too much and thus does not vary its MIT values. The samples with fine granulometry show a certain compaction of the layer; however this effect does not change the minimum ignition temperature in layer with respect to the non-compacted sample.

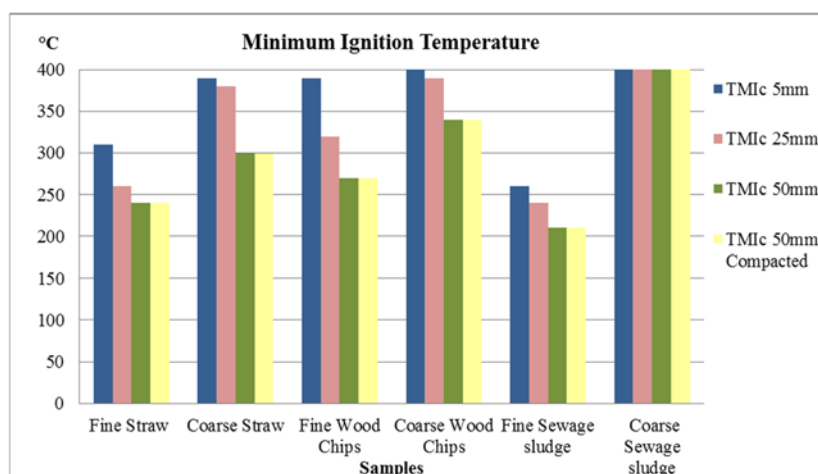


Figure 1. Minimum ignition temperature tests