## Minimum ignition temperature of hybrid mixtures

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## ABSTRACT

The minimum ignition temperature is an important safety value for handling gases, liquids and dust. The European regulation only provides standards to measure single-phase values. That poses a problem to industries where different phases occur at the same time, as there is no way to prove that the mixture does not have an ignition temperature that is not below the single values.

Partial aim of the joint research project NEX-HYS is to provide an extension to the standard for the minimum ignition temperature of dusts (IEC 80079-20-2). Therefore, the Godbert-Greenwald oven is modified to allow testing dust, liquid and gas alone and in mixture with each other.

Various experimental setups and combinations of dusts, liquids and gases and the single-phase values in comparison to the standardized values are tested and presented for discussion.

The proposed experimental setup is only a slight modification to the furnace mentioned in the standard. Main changes are a solvent reservoir and an additional gas supply. First results are already published as a proof of concept. To provide a reliable base for a standardization the influence of these changes according to the ignition behaviour is tested in detail. This includes various size parameters as well as the arrangement of the parts.

Following the minimum temperature of the single phases - gas, steam of evaporated liquids, dust - are tested and compared to the respective value obtained with the standard to be usually be applied. Subsequently the mixtures of phases can be tested. The setup would further provide the possibility to make tests to check the influence of other oxidizing atmospheres, the humidity in the gas phase or dust that have adsorbed liquids other than water, as well.

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