

**Abstract-**

***This paper discusses a measurement principle for online moisture determination of wood pellets that is based on capacitive sensing. To ensure reliability and proper operation of the sensing device even under harsh industrial conditions, a robust principle based on a frequency hopping approach is required. Therefore, we investigate the impact of multiple carrier frequencies and analyze the frequency dependency of the material permittivity. Two different electrode topologies, one based on parallel plates and the other on a planar structure, are tested using a laboratory prototype in a drying chamber. Investigations on the applicability of capacitive moisture measurement are carried out using stationary conditions. The non-invasive and in-situ moisture content determination of wood pellets in a screw conveyor is presented as an application of the proposed principle.***