



PAPER MOISTURE MEASUREMENT



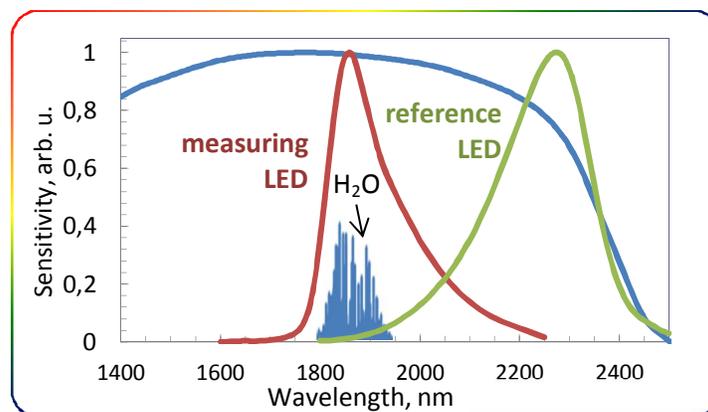
One of the key parameters of paper manufacturing is paper **moisture**. It is important to know the amount of moisture on every stage of paper manufacturing in order to control the technological process. There are several different techniques of **water** detection. We offer method of **optical absorption** based on **mid-infrared** LED-PD optopair.

Water has the main absorption band at **1800-1950 nm** (the data are taken from HITRAN Catalogue). So, we recommend using light emitting diode **Lms18LED** or **Lms19LED** as a measuring LED, **Lms22LED** as reference LED and **Lms24PD** series photodiode to detect signals from the both emitters.

The main principle of H₂O detection:

The measuring LED emits radiation at a wavelength corresponding to the maximum absorption of the water, the reference LED emits radiation at a wavelength that is not absorbed by the water. The concentration of the analyte is proportional to $\ln \frac{I_{reference}}{I_{measuring}}$, where $I_{reference}$ is an intensity of the reference LED, and $I_{measuring}$ is an intensity of the measuring LED.

The spectra of an **LED** and a **PD** for H₂O detection:



Advantages of our devices:

- **Non-contact** analysis
- Possibility to make a **compact design** of an optical cell thanks to compact size of the LED chip – **0.35 × 0.35 mm**
- Possibility to arrange customized multi-element arrays enables developing multi-wavelength emitters that include both the measuring and the reference LEDs
- No need of using additional optical filters – LED emission band width is comparable to absorption band widths of analysed substances
- **Low power consumption (<1 mW)**
- **Short response time (10–50 ns)**
- Possibility to achieve modulation **ranges** of up to **100 MHz**
- Operation temperatures up to +150°C
- **Lifetime of 80 000 hours**

