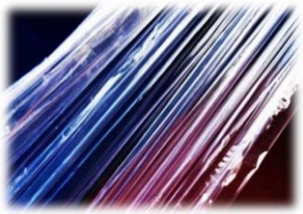
PLASTIC THICKNESS MEASUREMENT

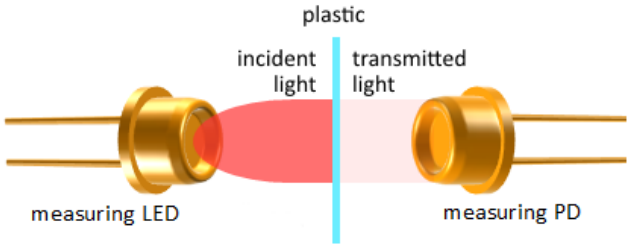


Due to constant increase of **plastic production** and rise of quality requirements it becomes inevitable to use reliable and efficient quality control systems. Mid-infrared light-emitting diodes and photodiodes manufactured by **LED Microsensor NT, LLC** have already found their usefulness in a vast area of applications and have much to offer to plastic manufacturers.

Thickness measurement is based on the Beer's law which states that intensity of transmitted light exponentially depends on thickness of material:

$$I(l) = I_0 e^{-k_\lambda l},$$

Where I_0 and I are the intensity of the incident light and the transmitted light, respectively; k_λ – the absorption coefficient, l – the material thickness.



Using mid-infrared LED-PD based solutions provides certain **advantages** for this sort of application:

- **Compact size** of the LED chip – 0.35x0.35 mm
- **Low power consumption** (<1 mW)
- **Short response time** – 10-50 ns
- **Modulation ranges** of up to 100 MHz can be achieved
- **Operation temperatures** up to +150°C
- **Lifetime** 80 000 hours

Our devices are able to measure **different types of plastic**:

- ✓ PE films
- ✓ Containers (bottles, jars, pots, cans etc.)
- ✓ Canalisation, drainage pipes
- ✓ PE electrical insulation
- ✓ Cases for devices
- ✓ PS Heat insulation
- ✓ Containers and films for food industry

01 PET
02 PE-HD
04 PE-LD
06 PS

- ✓ PVC fibers
- ✓ PVC electrical insulation
- ✓ Doors and windows
- ✓ Details for automotive production
- ✓ Packaging
- ✓ Water supply system pipes

03 PVC
05 PP

LED-PD based **evaluation kits and systems** for **plastic thickness measurement**

For quick start we offer **out-of-the-box** solutions that can be launched with minimal effort:

- **UDK Universal Evaluation kit** with modular design that includes:
  - Light emitting diode Lms23LED or Lms34LED (other LED is available) with an LED driver
  - Photodiode Lms24PD or Lms36PD (other PD is available) with a preamplifier
  - SDM synchronous detector
  - Any additional component(s) can be added by request

- **NEW LA-1t LED analyser** – a device oriented for the initial experiments with different liquid (and other) substances, enables defining the absorption properties of the analyzed sample in the spectral range 1.3 – 2.3 µm.

  LA-1t's optical module includes:
  - **8-element LED array** with peak emission wavelengths about 1.3, 1.4, 1.6, 1.7, 1.9, 2.1, 2.2 and 2.3 µm;
  - **Wideband photodiode** with a cut-off wavelength about 2.4 µm and 2 mm sensitive area diameter;
  - **ZigBee/Bluetooth** wireless data transmission module for **fast data transfer** to a data **control center;**
  - Battery power supply for **autonomous operation.**

LA-1t LED analyser

HEAD OFFICE **LED Microsensor NT, LLC** and R&D CENTRE **Microsensor Technology, LLC** (a resident of Skolkovo Innovation Centre)
✉ 10, A, Kurchatova str., 1N, St-Petersburg, 194223, Russia; info@lmsnt.com; **www.lmsnt.com**