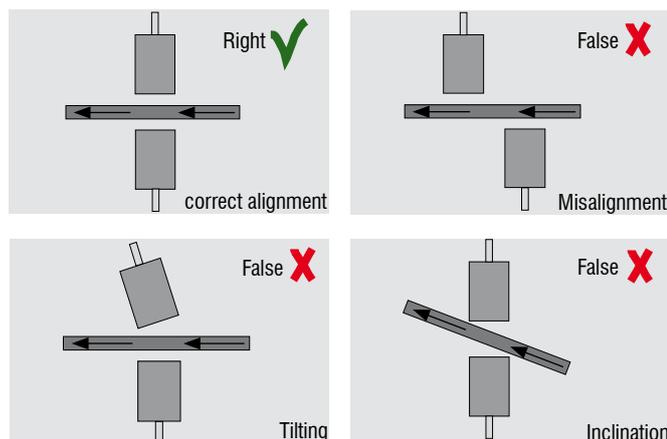


Precise thickness measurement with displacement sensors

Displacement sensors measure distance, movement and dimensions. If the measured values from two displacement sensors are evaluated together, the thickness of an object can be determined from this. However, in order to achieve a precise statement of the target thickness from the combined signals of two sensors, there are a number of factors that need to be taken into account.

Alignment of the sensors

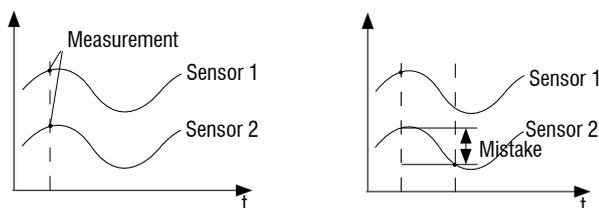
Special attention must be paid to the alignment of the two sensors installed opposite each other. No misalignment, tilting or inclination in relation to the target is permitted for the sensors. Example: For a misalignment of 1mm and an inclination of 2°, there is an error of 35µm; in the case of 10mm target thickness this increases to 41µm.



Synchronisation

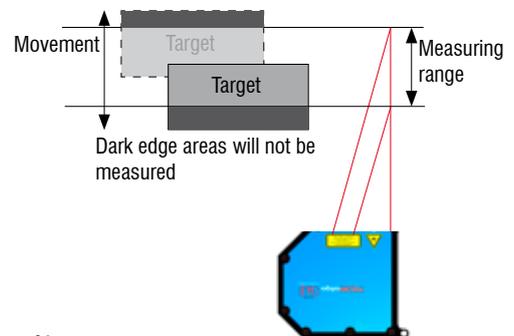
In order to avoid interference due to movement of the target, both sensors must be synchronised so that they perform the measurement at the same time at the exact opposite point of the target. If synchronisation doesn't occur defective measured data is produced. For example, micro-vibrations of the measuring object can occur if measurements are taken at different times, resulting in an error being output.

Example: For a time-delayed measurement of 1ms, a deviation of 125µm is produced (assuming 1mm vibration at 20Hz).



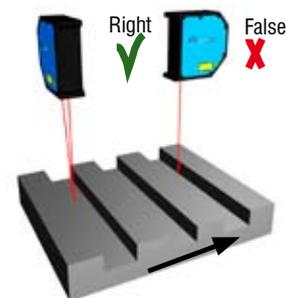
Positioning of the sensors / measurement range

Position, measurement range, thickness deviation and vibrations must be taken into account for the installation of the sensors. For correct measurements, the target must always be located within the measurement range. If the target is outside the measurement range, this can lead to faulty measurements. In particular, any special operating conditions such as Start, Stop or speed changes must be taken into account.



Arrangement of laser sensors

Laser sensors should not be installed until after specifying the running direction of the measuring object. In this way, higher accuracy and smaller deviation caused by the target surface are achieved. Shadowing of the beam path can also occur if the sensor is incorrectly installed.



Mounting the sensors

All requirements for sensor positioning and alignment (see above) and a stable sensor assembly should be satisfied for the mounting of the sensor. The most secure, reliable mounting is achieved by using the recommended mounting accessories. In principle, mounting with an O-frame is more stable than with a C-frame.