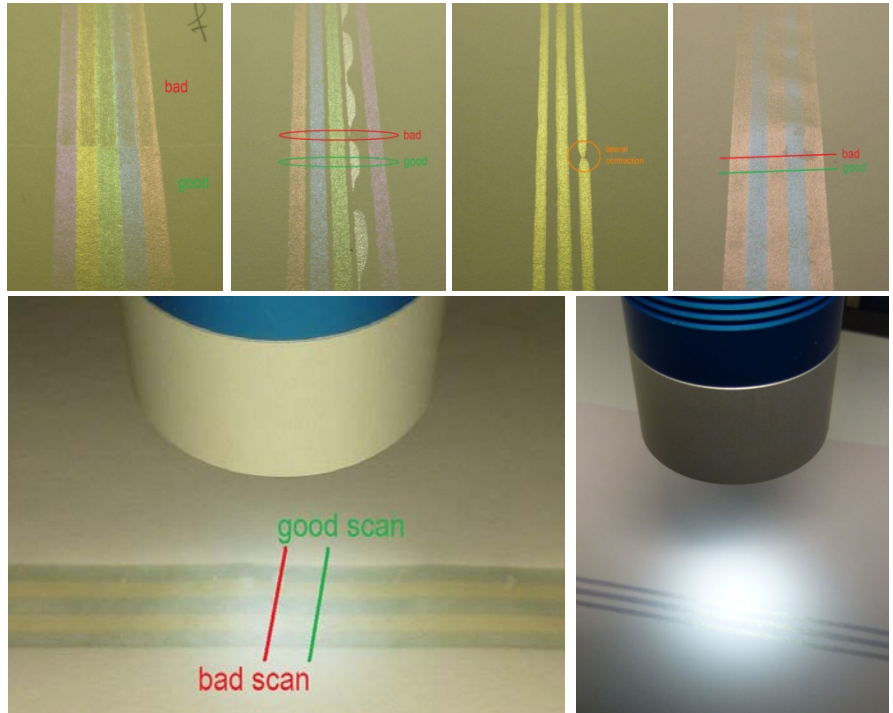




### 1. Detection of pearlescent color strips on security papers

The position as well as the quality of pearlescent multi color strips on security paper should be controlled. The position of the multi strip band should be hold with an accuracy of approximately  $\pm 0.1$  mm. Furthermore gaps in the strips as well as domains with rare pearlescent color should be detected. Due to the fact of the presence of multi color strips a line scan reflective sensor with a white light source is used for this task. The sensor **L-LAS-RL-20-W** is directed perpendicular to the paper surface, because of the, compared to the paper surface, higher direct reflection caused by the pearlescent colors. As shown in the screenshots, there is a proper difference between the good and the bad prints.



However, special algorithms have to be used to distinguish between the bad and the good prints. The area between the video signal and the comparator threshold is one of the special methods, another one is the comparator threshold profile, which is proportional to the video signal in the case of absence of the strips (paper background), instead of using just a line as a comparator threshold. The sensor delivers two analog outputs (0V ... +10V and 4mA ... 20mA), two digital outputs and two digital inputs. The scan frequency is 600 Hz and the resolution is typically 20 microns. The measurement range at a distance of approximately 50mm to the object is about 20mm.

