



### 1. Sleeve presence control on an injection needle

The presence of a sleeve on an injection needle should be controlled. For this purpose a color sensor type **SPECTRO-3-FIO-JR** in connection with an optical fiber type **R-S-R2.1-(6x1)-1200-67°** and an optical frontend type **KL-8-R2.1** are used. The distance from the frontend to the injection needle is around 11mm and the spot size at this distance is roughly 3mm x 0.5mm. A proper detection of the sleeve is possible as shown in the screen shots.

