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## Influence of roughness on conoscopic holography digitizing of DIN34CrMo4 Surfaces

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### Abstract

Conoscopic Holography is a non-contact digitizing technique used in inspection and reverse engineering tasks. A laser beam is projected onto a surface, and its reflection generates a holographic pattern inside the sensor. This pattern is later analysed and the distance between sensor and surface is calculated. Like other optical techniques, conoscopic holography shall be affected by surface properties and ambient conditions. This work deals with the influence of surface roughness and manufacturing process on the quality of digitizing. 34CrMo4 steel test specimens have been manufactured to obtain four different *Ra* levels. Two different manufacturing processes, electrical discharge machining (EDM) and ball-end milling (BEM) have been also considered. Quality of the digitized point clouds under different sensor configurations has been analysed, in order to provide a recommendation for optimal capture conditions.

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### 1. Introduction

Conoscopic Holography (CH) is a non-contact digitizing technique. When the reflection of a laser projected onto a surface passes through a conoscope, an interference pattern is generated and registered in a CCD. The computational analysis of this image provides a value for the distance between the sensor and the surface. Sirat et

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