ABSTRACT The research of crowns built for Pieta from the parish church in Skrzatusz is presented in the paper. Laser Induced Breakdown Spectroscopy, optical microscopy, and statistical factorial analysis were taken as diagnostic tools. History of the crowns begins in the XVth century from open shape, and then via addition of bows, crowning, and decorations goes on almost to the end of XIX century. LIBS measurements confirmed earlier data that crowns were made of a very thick gold-plated solid silver. Some differences between concentrations of component elements (Cu, Zn, Ag, Sn, Au, Hg, and Pb) in different crown parts were found which were next confirmed by multivariate factorial analysis. LIBS measurements showed that different crown parts were made of a bit different alloys. Optical digital microscopy demonstrated a very low destructivity caused by LIBS measurements which was found in 3D crater images.

Keywords: LIBS, factorial analysis, Pieta