The poster summarizes the results of the all-embracing investigation of a painting technique on metallic supports used in the works of Norbert Grund (1717–1767), a foremost representative of the Rococo painting in Bohemia, from the collections of the National Gallery in Prague. Grund’s oeuvre, rich in themes conceived in a playfully lightened, idyllic spirit, draws on various European painting schools for its motifs and styles. His small-size paintings enabled the collectors, particularly those from the burgher ranks, to build up a kind of miniature picture galleries, which were diminished versions of aristocratic and monastic collections. The small-size cabinet painting on metallic supports represents a considerable part of his oeuvre (Fig. 1). The utilization of metallic supports in fine art has initiated in the 16th century. However, it has never achieved such popularity as painting on canvas or a panel painting.

More than 40 works by Norbert Grund were studied in the National Gallery in Prague. The initial research was based on application of non-invasive X-ray fluorescence analysis (XRF) with a handheld NITON analyzer (Model XL3t) due to the heritage preservation and small format. The X-ray spectra (Fig. 2) were acquired for only 30 s and then the data were evaluated semi-quantitatively. Only several micro-samples were taken with the aim of the easier characterization of the surface treatment of the supports. This representative set of micro-samples was analyzed with methods of optical microscopy, Scanning Electron Microscopy and X-ray Microanalysis. Molecular analysis was done using Raman micro-spectroscopy. Analysis was performed on the individual pigment grains or in the cross sections using the mapping mode for the identification of individual components presented in the colour layers (Fig. 3). The combination of these microscopical techniques applied to such large collection enabled us to systematize obtained information and evaluate used materials. The most numerous group includes supports made of iron plates coated with tin layer, alternatively covered also with a protecting layer of an organic or a mineral basis (Fig. 3). Copper and brass supports were identified too. In addition, surface corrosion products of metallic materials were documented, see Fig. 4.

Interdisciplinary cooperation has enabled us to evaluate materials used in paintings attributed to Norbert Grund and also to evoke discussion on verification and specification of the authorship of several disputable works of art.

Acknowledgement: The work was realised thanks to the means of the project Norbert Grund (1717-1767) of the programme Czech Science Foundation, GACR, Identification code: GA13-07247S.
Fig. 1: Norbert Grund, Two Nymphs bathing and a Satyr, (Inv. no. O 272, size: 18.5×15.3 cm). On the reverse side there is a copper plate. Photo © National gallery in Prague 2014.

Fig. 2: X-ray fluorescence spectra acquired with the handheld NITON analyzer, a) the copper support, b) the iron plate coated with tin layer under the protective red painting layer, c) the iron plate coated with tin layer, d) the brass support.

Fig. 3: Norbert Grund, Playing Bowls (Inv. no O 5385, size: 26.5×36.5 cm). Raman spectra of the red layer and map showing distribution of the hematite in the cross-section of the sample. Raman spectra were recorded using 780 nm laser excitation of 2 mW power and 3 μm steps.

Fig. 4: Norbert Grund, Washerwoman (Inv. no. O 397, size: 17.8×19.2 cm). The degradation of iron and tin layer is visible on the surface of the support. Photo © National gallery in Prague 2014.