

# **METALLURGICAL CERAMICS FROM SERIPHOS (GREECE) - TECHNOLOGICAL CHARACTERIZATION IN VIEW OF EARLY CYCLADIC METALLURGY**

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Recent archaeometallurgical investigations on the Cycladic island of Seriphos have provided conclusive evidence for Early Bronze Age (EBA) copper production. Three copper slag heaps have been studied in north-western Seriphos at Kephala, Phournoi, and Avessalos. The results complement previous work on the neighbouring islands of Kythnos and Siphnos, for copper and lead-silver metallurgy respectively, and further reinforce the important role attributed to the western Cyclades as EBA Aegean metal suppliers.

The present study deals with the ceramic furnace fragments identified in large quantities on all three copper slag heaps on Seriphos. An assemblage of 54 samples, representing the three copper smelting sites, was selected for different physico-chemical examinations. Additionally, clays or clayey soils were sampled in the vicinity of each site in an effort to identify potential raw material sources, which could have been used for the furnace construction. The chemistry, mineralogy, and microstructural characteristics of the samples were studied using a combination of petrographic examination, X-ray diffraction (XRD) and scanning electron microscopy (EDS-SEM) analyses on the furnace fragments and the fired clays. Temperature gradients within the furnace walls were additionally estimated by studying the degree of vitrification by SEM and by XRD examination of individual layers taken successively from the inner to the outer surface of the fragments. The program also included luminescence dating - by Thermo Luminescence (TL) as well as by Optically Stimulated Luminescence (OSL) - of pure quartz grains extracted from furnace fragments from the hitherto undated site of Avessalos. Finally, based on the results of the study a computer model of a typical smelting furnace from Seriphos was developed, in order to assess its function and to simulate the operating conditions.

The results of this study not only contribute to the understanding of the manufacture of metallurgical ceramics on these sites, but additionally provide significant further insight into the technology of the copper smelting process.