

# Oral Presentation

## Materials and Technology of Glass Core-Vessel at Tell Amarna, New Kingdom, Egypt

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### Abstract

Glass core-vessel technique became common in the New Kingdom Egypt (from 18th Dynasty). It preceded the discovery of blow-pipe technique. The core was made out of a mixture of raw materials to give the final glass vessel shape and size. Once the glass material was applied and the wonderful vessel is finalized and stabilized, after annealing and cooling, the core material was removed, without compromising the integrity of the glass vessel itself. Therefore, the success or failure of glass production by this methodology largely depended on the recipe of the core mix. As the core material had to be removed in pulverized state, it has rarely been recovered in archaeological excavation. We present here analytical data for some exceptional core samples from the 18th Dynasty Tell Amarna, Egypt. Several analytical methods were utilized to fully characterize these samples. This included: compositional (elemental) analysis using particle-induced X-ray emission spectrometry (PIXE) and occasionally energy dispersive X-ray spectrometry (EDX); structural (mineralogical/phase) analysis using X-ray diffraction (XRD); textural (morphological) analysis using scanning electron microscopy (SEM); thermal analysis using thermo-gravimetric and differential thermal analyses (TGA/DTA). These analyses show for the first time that the core raw mix is made of three main components: animal bone, clay, and animal dung; sand might have been added as well. Laboratory experiments to reproduce glass core-vessel technology, using the discovered core mix recipe, were successful. This suggests that this recipe discovered at Tell Amarna might have been in common practice in New Kingdom Egypt at large. To the best of our knowledge, detection of animal bone as a major component of the core mix has never been reported in archaeological or archaeometric literature.

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