

The contribution of technical ceramic to iron smelting production at Sungai Batu, Bujang Valley

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Abstract: Iron smelting sites at Sungai Batu, Bujang Valley are dated from 535 BCE until 15th Century CE. The evidence of 17 sites found with abundance of iron slags and other artefacts clearly show that a large scale iron-smelting industry existed in Bujang Valley. The technical ceramics are one of the dominant discarded material in smelting process besides iron slag. The term ‘technical ceramics’ refers generally to any ceramics used in metallurgical or other high-temperature operations. Technical ceramics are essential tools for almost all metallurgical processes and were routinely exposed to a variety of conditions that they had to cope with. The technical ceramic found in archaeological sites can be classified as furnace, tuyere and brick. They were made by clay and play different roles in iron smelting process. Clays have the ability to withstand temperatures up to around 1,100°C without melting. This article will discuss

the significance of technical ceramic regarding the impact of iron production. The methods consist of collecting sample from archaeological site, auguring sample and scientific analysis such as X-ray fluorescence (XRF), X-ray diffraction (XRD) and scanning electron microscopes (SEM-EDX) analysis. The following discussion will further explain the selection of material and particular shapes in enhancing the iron smelting process in Sungai Batu. The result demonstrates that the technical ceramics were made from locally available supplies with some organic material and sand as temper. The site which was located in the vicinity of natural resources required in iron production such as water, ore and clay made the Sungai Batu Complex a strategic location for iron industry.

Keywords: Iron smelting, technical ceramic, Sungai Batu site