Rescue archaeological excavations brought to light the remains of a Bronze Age village close to the town of Afragola (Naples, Italy), partially destroyed and buried by pyroclastic density currents (PDCs) of the Pomici di Avellino eruption (Somma-Vesuvius, 3.8 ka BP). A previous investigation on TRM data from the Pomici di Avellino PDCs indicate they were still hot enough to cause death or severe injury to humans and animals. Although most of the deposition temperatures estimated throughout the village were between 260 and 320 °C, anomalous values were observed in some potsherds taken from Hut 1, Hut 12 and Hut 17. In order to understand the heterogeneous magnetic behaviour of potsherds in the excavated portion of the village a new set of samples embedded in the PDC deposits were taken. A total of 40 potsherds underwent petrographical, mineralogical, chemical and TRM analysis. In addition, a selection of 8 samples with strong differences in TRM was analyzed with Mössbauer spectroscopy. The heterogeneous magnetic behavior of the potsherds was a consequence of both their technological characteristics and their position in the stratigraphic succession. The result indicate that care should be exercised in the use of pottery to infer the deposition temperature of PDCs by TRM analysis, since its magnetic behaviour is not only determined by the raw materials, but also by their processing and firing. Moreover, the original function of the pottery vessels may complicate the thermal history of the samples and lead to a misleading interpretation of the data.