



## **The Thermoluminescence (TL) test, The scientific facts.**

The following information has been kindly supplied by Oxford Authentication Ltd, the Internationally recognised leader in the authentication of antique ceramics.

The company is headed by a qualified physicist with almost 40 years experience in this field and is the only company recognised by major international auction houses such as Christie's and Sotheby's, as well as museums and other international institutions.

Oxford Authentication is the only TL testing laboratory in the world working to full International quality assurance standards, with Lloyds Quality Assurance, ISO 2001.

### **What is a TL test?**

When a sample of pottery is heated to a sufficiently high temperature it emits a faint blue light known as thermoluminescence, or TL.

The amount of TL can be measured and its intensity is proportional to the time which has elapsed since the object was last heated, normally during kiln firing, and can be used to date when the object was made.

### **Is the TL test still a valuable tool in authenticating antique ceramics?**

Yes, very much so as long as you know the strengths and limitations. Several samples should be taken from each object at different places.

TL analysis can then tell us the following:

- Whether the clay is ancient or modern.
- Whether the clay contains restoration material.
- Whether the clay contains organic material, such as PVA, a bonding material used to consolidate archaeological material. This may be due to restoration or combined with powdered ancient clay to create new artifacts. If a sample contains organic material, a distinctive TL signal is obtained.
- TL can detect the "marriage" of sections from unrelated pieces by comparison of the TL signals from the different samples.

### **If a modern copy has been artificially radiated in an attempt to fool analysis, can the TL test detect this?**

It is highly unlikely that artificial irradiation is used on ordinary pottery as it is expensive and time consuming. However it is used on porcelain, which in general will fetch a higher price than pottery on the art market.

Exposure to irradiation will create an artificially high 'TL age'. Oxford has devised a test for irradiated porcelain which looks at four indicators to determine the likelihood that a piece has been exposed.

## O & O Chinese antiquities



**On a genuine Tang dynasty object (618 - 906AD) why is the quoted age range so wide, i.e. 900 - 1500 years ago?**

Excavated pottery cannot be dated to great precision as too much information regarding the environmental radiation contribution to the TL is lost when the pieces are removed from the ground. Very precise TL and internal radiation measurements are made but these do not compensate for the unknown factors. An estimate of these, based on experience, is substituted in the equation to calculate the age.

The quoted age limits are +/- 20% of the calculated TL age. This is based on the statistical analysis of hundreds of known age pieces. Although quite wide, this distinguishes between ancient and modern pieces, and hence determines authenticity.

### **Conclusion**

TL remains a powerful weapon in the authentication of ancient ceramics and Oxford Authentication is constantly evolving to combat the faker.

From a logical standpoint it is far better for a piece to have been TL tested showing that the clay is ancient, rather than relying on the word of the unqualified "expert" or vendor saying that the piece is genuine.