Industrial process problem solving, routine analysis consultancy and materials analysis.



Process Control Monitoring of TV Screen Glass Composition Using XRF Analysis

Production Process Control Requirement

The composition of the glass used in the manufacture of TV screens needs to be very tightly controlled for a wide range of elements in order to comply with the physical, mechanical and X-ray absorption properties required of the application.

Process Control Monitor

X-ray fluorescence (XRF) analysis is capable of producing the required level of accuracy with relatively short analysis times, ideal for process monitoring.

XRF is also able to resolve elements in combinations that are difficult to separate by other methods.

Below is an example of the analysis produced by XRF of a TV screen glass (Wt%).



Fig. 1. Typical Television Screen (Compared to a Pencil for Scale)

SiO ₂	Al ₂ O ₃	Na ₂ O	K ₂ O	CaO	MgO	BaO	Sb ₂ O ₃	Fe ₂ O ₃	SrO
60.44	2.81	8.53	6.71	0.66	0.32	8.56	0.38	0.041	8.44
CeO ₂	NiO	CoO	ZrO ₂	CI	La ₂ O ₅	Nd ₂ O ₃			
0.32	0.0166	0.00179	2.52	0.0111	0.0193	0.059			

In this example, the concentration range covered in a single analysis is from \sim 20 ppm for Co oxide to \sim 60% for Si oxide.

The complex mixture of rare earth elements which are present in low concentrations has also been resolved and accurately quantified by this method.

LPD Lab Services Limited

- a unique combination of analytical equipment, techniques, and investigative experience

Benefits of XRF Analysis

By comparing the composition of a sample glass to a standard, changes in physical parameters such as density, colour, transmission etc. can quickly be related to a change in the concentration of one or more of the elements in the sample.

Regular sampling and analysis of the glass can be proactive in avoiding scrap, since changes in the composition can be identified and corrected before they become large enough to cause rejects resulting from changes in the physical properties.

The raw materials used for the production of the glass can also be accurately analysed by this XRF technique. This avoids any changes in the composition of the raw materials that might alter the composition of the glass.



Fig. 3. X-ray fluorescence spectrometer.

XRF Sample Types

The XRF spectrometer is capable of analysing most forms of material – Solid, powder, liquid, dust etc. with the same level of sensitivity and accuracy.



Fig. 2. An array of 25mm wide samples of TV screen glass awaiting bulk characterisation with XRF

Contact us today

Find out how we can help solve your problems in process improvement, process control and materials analysis

> LPD Lab Services Phone: +44 (0)1254 676074 E-mail: enquiries@lpdlabservices.co.uk Web: www.lpdlabservices.co.uk