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Report on:

Examination of a Glass Sample Reported from Cottage Pie

Work performed by Campden BRI (Chipping Campden) Limited Report number: MI/REP/170532-00526/1 • Issue date: 31st May 2017

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Our ref: Glass Report Page count: 12

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SAMPLE DETAILS

Sample Reference	1234567
Supplier Name:	Cottage Pies R Us
Supplier No.:	556465

SAMPLE INFORMATION

LIMS sample number(s)	:	15232565
Date sample(s) received	:	25 th May 2017
Packaging	:	In a white-lidded pot, in a plastic bag
Storage conditions	:	Ambient temperature
Date(s) sample(s) examined	:	30 th May 2017

METHODS AND REFERENCES

Analyst reference	:	LKS	
Method reference(s)	:	TES-AC-192 :	Light Stereomicroscopy
		TES-AC-193 :	Compound Light Microscopy
		TES-AC-198 :	Scanning Electron Microscopy and X-ray Microanalysis
Deviations from the method reference(s)	ŗ	None	

method reference(s)

RESULTS

The complaint sample consisted of one piece of clear, colourless glass, which was photographed as received and can be referred to in Plate 1. The fragment had one convex, moulded surface, leading to a convex, manufactured edge. This is a surface arrangement consistent with a fragment of a rim from domestic glassware. In addition, it had an opposing fractured surface, with all other edges being fractured. Numerous scuff marks, including those that appeared metallic were seen along the apex of the fragment (Plate 2). These are consistent with the original item having been repeatedly used. The radius of curvature of the fragment was estimated to be 6cm, indicating the original item had an approximate diameter of 12cm.

A small amount of surface deposit was seen adhered to the complaint sample, which was removed and examined under a compound microscope. The deposit consisted of potato cells (Plate 3), muscle fibres (Plate 4), mesocarp cells consistent with the flesh of a red-skinned fruit or vegetable, such as a

tomato or garden/chilli pepper, cells consistent with the skin of a tomato (Plate 5), 'hook' hairs consistent with a herb (Plate 6), plant leaf tissue possibly from parsley (Plate 7) fat and fungal hyphae (Plate 8).

X-ray microanalysis was performed on the complaint sample (Figure 1). This showed the presence of oxygen, sodium, aluminium, silicon and potassium. This is a typical composition of heat-resistant glass, such as 'Pyrex'.

X-ray microanalysis was also performed on the metallic scuff marks (Figure 2). This showed the presence of the above elements, in addition to nickel, chromium, manganese and iron, all of which are constituents of stainless steel. An elemental map showing the distribution of these elements can be referred to in Figure 3.

CONCLUSIONS

It was concluded that the complaint sample was a worn piece of a rim from a heat-resistant glass, such as 'Pyrex', thought to have originated from an item measuring approximately 12cm in diameter. Potential sources include domestic items, such as bowls and casserole dishes. The stainless steel scuff marks on the apex of the fragment may have originated from contact with a tap/similar item, which may in turn have caused the initial breakage. Alternatively, the scuff marks could have originated from repeated contact with a metal drainage board. The surface deposit adhered to the complaint sample was consistent with contact with the reported product in addition to tomato. The fungal matter seen within the surface deposit was considered to be due to degradation of the surface deposit.

PLATE 1 Shows the complaint sample photographed as received against a millimetresquared background



PLATE 2 Shows an example of the scuff marks (circled) seen along the apex of the fragment (top) and a close up (bottom)



PLATE 3 Shows some of the potato cells seen within the surface deposit adhered to the complaint sample. Magnification x 109



PLATE 4 Shows an example of the muscle fibres seen within the surface deposit adhered to the complaint sample. Magnification x 109



PLATE 5 Shows the cells consistent with the skin of a tomato, seen within the surface deposit adhered to the complaint sample. Magnification x 220



PLATE 6 Shows one of the 'hook' hairs seen within the surface deposit adhered to the complaint sample. Magnification x 435



PLATE 7 Shows the cells consistent with parsley, highlighted purple with toluidine blue seen within the surface deposit adhered to the complaint sample. Magnification x220



PLATE 8 Shows an example of the fungal hyphae seen within the surface deposit adhered to the complaint sample. Magnification x435



Glass Analysis

LIMS Project Number: 170532-00526 LIMS Sample Number: 15232565 Spectrum 1 Si О Na к ----2 ----• • $\overline{}$ 0.5 2.5 3.5 4.5 5 1 1.5 3 4 Full Scale 28946 cts Cursor: -0.040 (1587 cts) keV

Glass Analysis

LIMS Project Number: 170532-00526 LIMS Sample Number: 15232565 Metal scuff mark



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Glass Analysis



Electron Image 1



Fe Ka1

LIMS Project Number: 170532-00526 LIMS Sample Number: 15232565 Metal scuff mark





Ni Ka1

Cr Ka1

Comment:

The top left image is an electron micrograph of one of the metallic scuff marks, taken using the backscatter detector. The bright white area denotes the presence of elements with a higher atomic number compared to the background material (glass). The remaining images are element maps, showing the distribution of nickel (Ni), chromium (Cr), and iron (Fe) in and around the scuffed area, represented by the white regions.

FIGURE 3