

XL Code: 24/NCS001/163a1

XL Data: xlem1672-1703

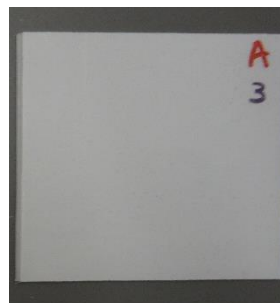
Date: 13 Aug 2024

Study & Sample Details
Client: Groglass

Study Description:

determination of the effect of the sample on Copper, Silver and Lead coupons under controlled conditions.

Sample Description:

Clear, colourless acrylic sheet.
Note: protective film removed before testing.

Sample: A Test 3

Methodology

Procedure: SMART assay. *Note: protective film removed.* A portion of the sample was sealed in a glass container with abraded and cleaned test coupons adjacent but not in contact. Surfaces were micro-spectroscopically compared with coupons held under equivalent conditions without sample.

Sample: portion

Coupons: Copper, Silver (999), Lead

Sample Size: 8cm²
Standards: Cu, Ag, Pb

Duration: 14 days

Vessel: 30ml

Humidity: 60%

Temperature: 30°C

SMART Results Summary

The results of the SMART testing are summarised as follows:

<u>Coupon</u>	<u>Et</u>	<u>Result</u>
Copper	~0	no apparent excess deterioration
Silver (999)	~0	no apparent excess deterioration
Lead	~0	no apparent excess deterioration

Explanatory Notes:

Et is a measure of the deterioration of a coupon surface in the presence of a sample in excess of that occurring for an equivalent "reference" coupon under corresponding conditions without the sample. It is based on changes in the surface chemistry and provides a measure of the relative degree of deterioration occurring due to the influence of the sample. A value of Et~0 is assigned where the sample coupon is statistically indistinguishable to the reference. For comparison, the vapour of a 0.25%v/v acetic acid solution with copper at 20°C gives an Et ~100; representing a severe corrosion of the surface, visibly evident after a few weeks. Results are classified according to the degree of deleterious observations:

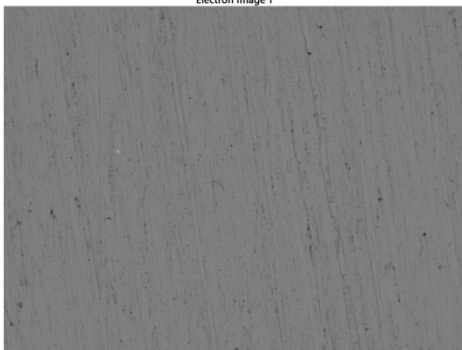
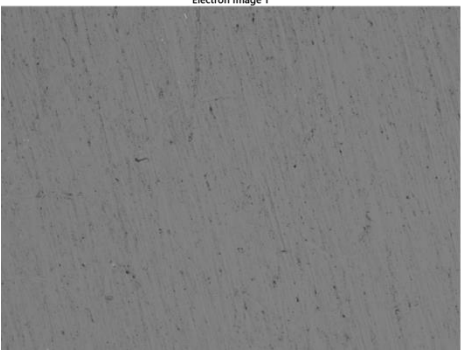
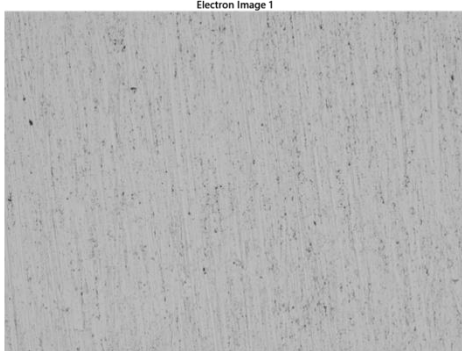
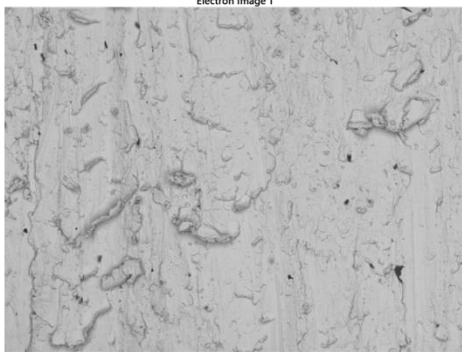
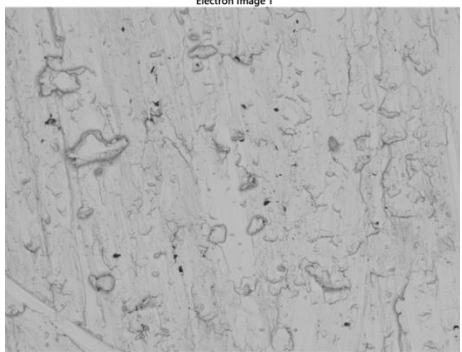
immediate concern > strong concern > concern > monitor > no apparent excess deterioration

The actual degree of deterioration experienced on-site will vary depending on the target materials, circumstances, environment, conditions prevailing, duration and nature of exposure. The results presented here apply only to the sample studied.

SMART testing has been developed by and is carried out exclusively for NCS by Chiralabs Ltd

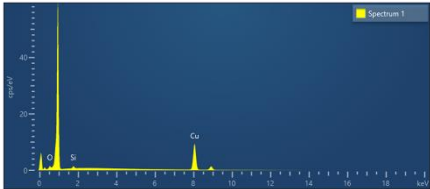
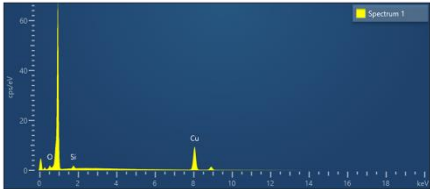
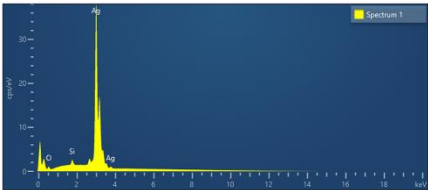
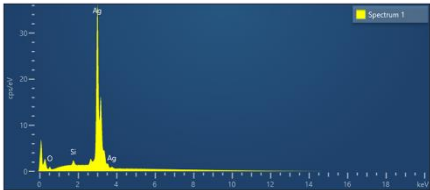
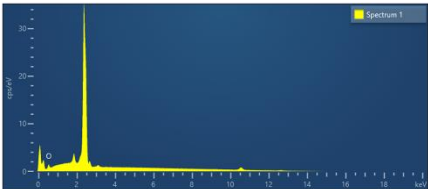
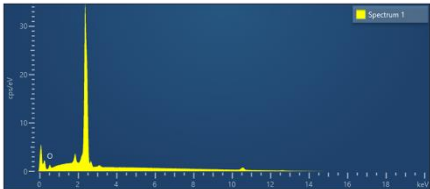
SMART SEM Data

Representative Scanning Electron Microscopy images of the coupon surfaces are as follows:

<u>Coupon</u>	<u>Post-incubation SEM Images</u>	
	<u>Reference</u>	<u>With Test Sample</u>
Copper	 Electron Image 1	 Electron Image 1
Silver (999)	 Electron Image 1	 Electron Image 1
Lead	 Electron Image 1	 Electron Image 1

SMART EDS Data

The corresponding representative Energy Dispersive Spectroscopy spectra of the coupon surfaces are as follows:

Coupon	Post-incubation EDS Spectra	
	Reference	With Test Sample
Copper		
Silver (999)		
Lead		

Note: The minor signals from silicon derive from microscopic silica particles from the abrasion and cleaning regime of the test coupons and are corrected for in the analysis and calculation of Et.