BUREAU OF ANALYSED SAMPLES LTD

ANALYSIS REPORT

COPPER BASE ALLOY REFERENCE MATERIAL

CURM No. 48.02-1

CARTRIDGE BRASS

The material for this CURM was prepared specially for Bureau of Analysed Samples Ltd using a method of casting known to provide material of uniform composition in a form suitable for use as calibration reference materials in XRF and optical emission spectroscopic analysis. Using Optical Emission Spectrometry the samples have been shown, by statistically designed procedures, to produce reproducible results.

The chemical analysis of representative turnings was carried out independently by both Bureau of Analysed Samples Ltd., and another laboratory experienced in the analysis of non-ferrous materials. The values reported are the overall Means and Standard Deviations (s.d.) of three separate determinations made in each laboratory.

ANALYSIS

mass content in %

Element	Mean	s.d.	Element	Mean	s.d.
Cu	**67.16**	0.02	As	**0.025**	0.001
Sn	**0.035**	0.002	Sb	**0.037**	0.004
Pb	**0.084**	0.001	Bi	**0.004**	0.0005
Zn	**32.58**	0.08	Al	**0.013**	0.002
Ni	**<0.001**	.....	S	**0.007**	0.0005
P	**0.012**	0.001	Mg	**<0.0005**	.....
Fe	**0.053**	0.004	Cd	**<0.0005**	.....
Si	**0.010**	0.001	Cr	**0.004**	0.0005
Mn	**0.067**	0.001			

Note: *This CURM is available in bottle of 100 g of turnings or as a chill cast disc, approximately 50 mm diameter x 12 mm thick, with a single chilled working face (smaller diameter). Spectroscopic reproducibility has been shown to be reliable to a depth of 5 mm below the chilled surface as supplied. The disc should therefore be discarded when the thickness is reduced to 7 mm.*

It has been established that materials of similar composition from different sources may respond differently on Optical Emission Spectrometers. CURMs are intended primarily for the construction of basic response curves which should be related to the response curves obtained from an identical examination of the user's own material.

N.B. Although these samples have been carefully analysed by both BAS Ltd and an independent laboratory, using the methods detailed overleaf, they have been classified as Reference Materials (RM)* and not Certified Reference Materials (CRM)* in order to distinguish them from the BAS Certified Reference Materials which are normally analysed by at least five laboratories.

* See over for ISO definitions.

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INFORMATION ON METHODS USED

Element	Chemical Methods used for the Analysis of this RM
Copper	Electrolytic deposition
Tin	FAAS
Lead	FAAS
Zinc	FAAS
Nickel	FAAS
Phosphorus	Photometric as phosphovanadomolybdate, with extraction
Iron	FAAS
Silicon	Photometric as molybdenum blue FAAS
Manganese	FAAS
Arsenic	Photometric with silver diethyldithiocarbamate, separation as arsine FAAS
Antimony	FAAS
Bismuth	FAAS
Aluminium	FAAS
Sulphur	Photometric as methylene blue after separation as hydrogen sulphide. High frequency combustion, infra-red absorption
Magnesium	FAAS
Cadmium	FAAS
Chromium	FAAS

Abbreviations: FAAS Flame Atomic Absorption Spectrometry

* According to the International Organisation for Standardization (ISO Guide 30-1992) the definitions for RM and CRM are as follows:-

Reference Material (RM): A material or substance one or more of whose property values are sufficiently homogeneous and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials.
Certified Reference Material (CRM): A reference material, accompanied by a Certificate, one or more of whose property values are certified by a procedure which establishes its traceability to an accurate realisation of the unit in which the property values are expressed and for which each certified value is accompanied by an uncertainty at a stated level of confidence.

NEWHAM HALL,
MIDDLESBROUGH
ENGLAND, TS8 9EA

for **BUREAU OF ANALYSED SAMPLES LTD.**
R.P. Meeres
Managing Director

Revised September 2003
(first issued in March 1995 without reference to availability in chip as well as disc form)