

### ELEMENTS IN MILD STEEL WELDING FUME

Unit Number \_\_\_\_\_

Certification date: February 2013

Analyte	Number of data sets accepted	Certified Value <sup>[1]</sup>	Uncertainty <sup>[2]</sup>
	<i>n</i>		<i>% m/m</i>
Iron	6	42.8	± 0.7
Manganese	10	1.48	± 0.03
Zinc	9	21.7	± 0.9

[1] The certified value is derived from the unweighted mean of *n* values, each value being the mean of a set of results obtained in a different laboratory. The certified values and their uncertainties are mass fractions based upon analysis of a recommended nominal 10 mg sample mass.

[2] Expanded uncertainty corresponding to a level of confidence of approximately 95 %.

#### Signed

Dr. Duncan Rimmer  
Health Capability Group Head  
HSE's Science and Research Centre  
Harpur Hill  
Buxton  
SK17 9JN  
United Kingdom

# CERTIFICATE OF ANALYSIS

## Description of the sample

This material is a bulk powder derived from the welding of mild steel components. It is supplied as a nominal 1 g sample in a glass bottle. Preparations of the material, homogeneity, stability and certification studies used in this certification are described in HSE report AS/2012/11 [3].

## Analytical method used for certification

Inductively coupled plasma atomic emission spectrometry (ICP-AES) as codified in ISO 15202-3:2004.

## Traceability

Certified values obtained by analysis of test solutions, prepared via the dissolution of the recommended 10 mg sample amount, are traceable to the SI (Système International d'Unites) via calibration using substances with certified purity. The performance of this dissolution step has been controlled by the application of standard validated methods such as ISO 15202-2:2012, NIOSH 7300:2003, OSHA 125G:2002 and EPA 3052:1996 (or in-house digestion methods with equivalent performance) during the certification exercise.

## Stability

HSE considers this welding fume material will remain stable if stored under the conditions defined below. This certificate is valid until 31<sup>st</sup> March 2021.

## Safety Information

No hazardous effect are to be expected when this material is handled and used in a laboratory setting by trained analytical chemists using appropriate controls. It is recommended however that this material should be handled and disposed of in accordance with guidelines for handling laboratory reagents in force at the site of end use or disposal.

## Storage

On receipt this reference material should be stored capped at ambient temperature (ca. 20°C) in a dry and clean atmosphere.

## Intended use

This reference material has been produced to assist analysts in verifying the performance of the analytical methods they employ in the elemental analysis of welding fume samples collected from the working environment. In particular this material, alongside HSE companion reference material SSWF-1 [4], are designed to check the performance of applying a dissolution step, as codified in standard validated methods such as ISO15202-2, ASTM D7035, NIOSH 7300, OSHA 125G, EN 13656 and EPA 3052 with subsequent analysis using atomic spectrometric techniques.

This material can also be used to assist in developing new sample dissolution procedures, preparing matrix recovery quality control charts or in the training of new analysts. This material is not to be used for instrument calibration.

## Instructions for use

The material should be used as supplied. The recommended amount of sample to be used is 10 ( $\pm$  1.0) mg. However before taking a sample, a re-homogenisation by manual shaking of the closed bottle is recommended. Analytical results have to be corrected to the dry mass content of the material by drying overnight at a nominal 95 °C using a separate sub-sample.

## Legal Notice

The certified values quoted in this certificate are HSE's best estimate of the true values within the stated uncertainties and based upon the techniques and procedures described in the accompanying certification report [3]. In no event shall HSE be liable for any damages (including, without limitation, lost profits, business interruption, or lost information) arising out of the use of or inability to use HSE welding fume reference materials, even if HSE has been advised of the possibility of such damages. HSE will inform purchasers of any updated information regarding the material or its certification values and will refund the purchase price of the material in such circumstances where proven defects in this material have been brought to its attention.

[3] AS/2012/11 Certification Report: Reference Material: Elements in mild steel welding fume, February 2013, available from the Health and Safety Laboratory. [4] AS/2012/12 Certification Report: Reference Material: Elements in stainless steel welding fume, February 2013, available from the HSE's Science and Research Centre.