



# Czech Metrology Institute

Dept. of Reference Materials Certification

Radiová 3

102 00 Praha 10

## CERTIFICATE

No. 1014-CM-2025-07

### CERTIFIED REFERENCE MATERIAL CZ 2025 A

PURE IRON WITH CERTIFIED CONTENT OF CARBON AND SULPHUR

**Designed** for the calibration and validation of combustion methods with a minimum sample weight 0,25 g. CRM, complementary to the set CZ 2003 – 2008, extends its range to the trace contents.

#### Manufacture and technical parameters

The candidate material was a commercial pure iron powder, sieved to the fraction between 0,1 mm and 0,2 mm grain size. CRM is available in 200 g units in glass bottles with plastic lids, sealed in plastic containers.

**Homogeneity** was tested by combustion - IR MAS, according to the ISO REMCO Guide 35. Both within-bottle and between-bottles inhomogeneity were tested and found statistically insignificant.

#### Stability and storage

The CRM material and certified constituents are stable over the entire period of validity. The CRM must be stored in dry and non-corrosive environment, with the lid replaced immediately after each weighing.

#### Producer

SPL, Šunychelská ul. 1159, CZ - 735 81 Bohumín, Czech Republic  
tel./fax +420 596014627, e-mail: info@spl-bohumin.cz

**Project manager:** Iva Bogumská

Production and procurements, testing and certification were carried out in compliance with the ISO REMCO Guide 34 (2000).

### CERTIFIED VALUES AND THEIR UNCERTAINTIES (expressed in % m/m)

**Carbon** 0,0020 ± 0,0003

**Sulphur** 0,0018 ± 0,0002

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Valid until: 1.6. 2022

Ing. Vladimír Perší  
Director of Regional Branch Praha



## CERTIFICATION

**Characterisation** was based on the interlaboratory experiment carried out by selected competent laboratories, in compliance with the ISO REMCO Guide 35 (1989).

### Traceability

The laboratory results were traced to the matrix-matching CRMs and primary substances.

### Methods

The combustion in a stream of oxygen with infrared – molecular absorption spectrometry was applied for both carbon and sulphur.

### Participating laboratories

BAS, Middlesbrough,	United Kingdom
Chemopetrol a.s., Litvínov	Czechia
ICRM, Ekaterinburg,	Russia
Instytut Metalurgii Żelaza, Gliwice	Poland
Moravské železářny a.s., Olomouc	Czechia
Qualitest Lab. Ltd., Dunaújváros	Hungary
Třinecké železářny a.s., Třinec	Czechia
U.S. Steel Košice-Labortest s.r.o., Košice	Slovakia
VÍTKOVICE-Zkušebny a laboratoře spol. s r.o.	Czechia
ŽDB a.s., Bohumín	Czechia
ŽDAS a.s., Žďár nad Sázavou	Czechia

### Evaluation

First the distribution of the laboratory values and their means were assessed technically to justify the deletion of possible outliers, than the gross means were computed by a standard statistical software.

**Certified values** are the gross means of eight laboratory means accepted by the technical and statistical assessment, rounded identically as their stated uncertainties.

**Uncertainty** was estimated with respect to ISO Guide to Expression of Uncertainty in Measurement, 1993 and Document EURACHEM, Quantifying Uncertainty in Analytical Measurement, 1995, as the standard deviation of the gross mean expanded by multiplying by the coverage factor  $k=t$  (for  $\alpha=0,05$ ). It is expressed as a halfwidth of the two-sided interval. The uncertainty estimates were rounded to one valid figure.

### Users instruction

The CRM must be used under the same conditions (crucible, accelerators, time-temperature setting), as used for the analysed samples, in accordance with the instrument manual.

**CMI responsible person:** Jan Tichý

