METALS

and Related Products

Reference Materials Catalogue 2008

LGC Standards

Excellence through measurement

LGC Standards office contact details:

Bulgaria
LGC Standards Sp. z o.o.
Офис 102
Бул. "Г.М. Димитров" 52А
1125 София, България

Tel: +359(0) 2 971 4955
Fax: +359(0) 894 780 154
Email: bg@lgcstandards.com

Czech Republic
LGC Standards Sp. z o.o.
Organizační složka
Hněvkovského 65
Brno
617 00
Česká republika

Tel: +420 543 529 205
Fax: +420 543 529 205
Email: cz@lgcstandards.com

Finland
LGC Standards AB
Albanoliden 5, 4 trappor
Box 1737
SE-501 17 Borås
Sweden

Tel: +46 (0)33 20 90 60
Fax: +46 (0)33 20 90 79
Email: se@lgcstandards.com

France
LGC Standards SARL
6, Rue Alfred Kastler
B.P. 83076
67123 Molsheim
France

Tel: +33 (0)3 88 04 82 82
Fax: +33 (0)3 88 04 82 90
Email: fr@lgcstandards.com

Germany
LGC Standards GmbH
Mercatorstr. 51
46485 Wesel
Germany

Tel: +49 (0)281 9887 0
Fax: +49 (0)281 9887 199
Email: de@lgcstandards.com

Hungary
LGC Standards GmbH
Magyarországi Közvetlen
Kereskedelmi Képviselet
H-2000 Szentendre
Körte u. 4.
Hungary

Tel/Fax: +36 (06) 26 314 891
Email: hu@lgcstandards.com

Ireland
4 Manor Lodge
Magherafelt
County Derry
BT45 6QL
Ireland

Tel: +44 (0)28 7930 0078
Mobile: 07921 872595
Email: patrick.henry@lgcstandards.com

India
LGC Promochem
PO Box 8061
No. 142, 3rd Floor, 5th Cross
Rajmahal Vilas Extension
Bangalore 560 080
India

Tel: +91-080-2361 4774
Fax: +91-080-2361 3859
Email: in@lgcpromochem.com

Italy
LGC Standards S.r.l.
Via Venezia, 23
20099 Sesto San Giovanni
Italy

Tel: +39 02 2412 6830
Fax: +39 02 2412 6831
Email: it@lgcstandards.com

Poland
LGC Standards Sp. z o.o.
ul. M. Konopnickiej 1
Dziekanów Lesny
05-092 Lomianki
Poland

Tel: +48 (0)22 751 31 40
Fax: +48 (0)22 751 58 45
Email: pl@lgcstandards.com

Romania
LGC Standards GmbH
Str. Muncitorilor nr.1/2
400424 Cluj-Napoca
Romania

Tel/Fax: +40 364 116890
Mobil: +40 749 255121
Email: ro@lgcstandards.com

Spain
LGC Standards S.L.U
C/Salvador Espriu 59, 2º planta
08005 Barcelona
España

Tel: +34 93 308 4181
Fax: +34 93 307 3612
Email: es@lgcstandards.com

Sweden
LGC Standards AB
Albanoliden 5, 4 trappor
Box 1737
SE-501 17 Borås
Sweden

Tel: +46 (0)33 20 90 60
Fax: +46 (0)33 20 90 79
Email: se@lgcstandards.com

United Kingdom
LGC Standards
Queens Road
Teddington
Middlesex
TW11 0LY
United Kingdom

Tel: +44 (0)20 8943 8489
Fax: +44 (0)20 8943 8405
Email: uksales@lgcstandards.com

USA
LGC Standards
5853 Post Road, Suite 201B
East Greenwich, RI 02818, USA

Tel: +1 401 398 7892
Fax: +1 401 398 7893
Email: David.Krost@lgcstandards.com

www.lgcstandards.com

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Introduction

About LGC Standards

LGC Standards is Europe's most comprehensive source of reference materials. We work closely with the leading manufacturers to offer laboratories worldwide improved access to reference materials, all designed to cover an increasingly large range of parameters.

Our network of offices in Europe, India and the United States, combined with our extensive experience in selling reference materials and our technical expertise, allow LGC Standards to work in partnership with our customers to provide fast delivery together with sound technical advice as well as dealing with complex import and export regulations.

LGC, whose Research and Technology Division acts as the designated UK National Measurement Institute (NMI) for Chemical and Biochemical measurement, has a long history in the development and validation of analytical methods and the production of reference materials.

Many of the analytical methods, which cover the food, environment, industrial, clinical and pharmaceutical sectors, are accredited to ISO/IEC 17025 (Requirements for the competency of testing and calibration laboratories). Full details of the accreditation schedule can be found on the UKAS website www.ukas.com.

LGC's Research and Technology Division is accredited to ISO Guide 34 (General Requirements for the competence of reference materials producers) for the production of reference materials. The measurement capabilities used to produce certified reference materials in its capacity as the UK NMI are verified through participation on key comparison studies organised by the Consultative Committee for the Amount of Substance (CCQM) of the International Weights and Measures Organisation (BIPM). The certificates are recognised by other National Measurement Institutes, under the Mutual Recognition Arrangement.

In its role as the NMI, LGC serves on the International Organisation for Standardisation (ISO) Committee for Reference Materials (REMCO), which aims to carry out and encourage a broad international effort for the harmonization, production and application of certified reference materials (CRMs)

LGC has a long history in the development and validation of analytical methods and the reference materials production facility at LGC, complements this expertise. LGC also offers a range of chemical and bio-analytical laboratory services across a variety of industries including: food and agriculture, environment, life sciences, chemicals and forensic science. LGC also plays a pivotal role in a number of programmes with both government and industry to improve analytical standards and laboratory performance.

This catalogue

The LGC Standards' catalogue for Metals and related materials presents a listing of reference materials grouped according to their matrix type and further subdivided by their chemistry. Listings give information on each product such as composition, weight of sample and format. The Reference Materials listed in this catalogue represent some of the most comprehensive ranges suitable for chemical and spectrometric techniques such as XRF/XRD, OES, AA, ICP and Combustion analysis.

Sourcing of reference materials

While this catalogue includes some of the more widely used materials, it is not possible to provide a comprehensive list of all the reference materials which can be provided by LGC Standards. Through our network of offices and extensive experience in sourcing reference materials, the list of materials we can provide is impractical to include in one catalogue.

Please use this catalogue as a first point of reference, and to locate your local LGC Standards office. Contact your nearest office to place an order and to request any products not included in this catalogue.

Producers of reference materials

Federal Institute for Materials Research and Testing (BAM)

The Federal Institute for Materials Research and Testing (BAM) has a long tradition in the production of Certified Reference Materials. Starting in 1912 with a "Normal Steel" for the determination of carbon, the development of new CRMs has increased continuously. One year later eight steel samples with different carbon contents were available. The development continued with the participation of regional German material research and testing institutes as well as industry (1957). In 1968 within the framework of EURONORM, the first European CRMs in the field of iron and steel were issued.

Today a large range of ferrous and non ferrous CRMs together with environmental CRMs and CRMs for engineering materials are offered.

IRMM

BCR® and IRMM reference materials (BCR® is a registered trademark of JRC-IRMM) are the products of both research funding and direct action programmes of the European Commission, in which new or improved measurement or testing methods are developed. These programmes are aimed at improving, harmonising or standardising measurements and testing in the European Union.
As an authorised distributor of BCR® reference materials LGC Standards currently holds stock of more than 5000 units of certified BCR® and IRMM reference materials under carefully controlled and monitored conditions.

European Reference Materials (ERM®)

The ERM® range of reference materials was launched in May 2004. It is the result of collaboration between three major reference material producers, LGC in the UK, the Institute for Reference Materials and Measurement (IRMM) in Belgium and Bundesanstalt für Materialforschung und Prüfung (BAM) in Germany. The partners are committed to using the most advanced principles for the production of certified reference materials. The certified values have clearly defined and stated traceability and are internationally recognized through participation of the partners in key comparisons organized by the Bureau International des Poids et Mesures (BIPM). All ERM® materials are subject to rigorous homogeneity and stability testing guaranteeing the certified values for every unit over its entire shelf life.

The National Institute of Standards and Technology (NIST)

NIST produces standard reference materials (SRMs®). Based in the United States, NIST has provided reference materials to industry and commerce for nearly 100 years. NIST collaborates with companies to provide academia and industry with SRMs for expanding areas such as air and water pollution, which are international issues.

Bureau of Analysed Samples (BAS)

Bureau of Analysed Samples has a long history in producing certified reference materials (CRMs) for chemical analysis (BCS-CRMs and EURONORM-CRMs) including a wide range of plain carbon and alloy steels, cast iron, ferro alloys, non-ferrous, alloys, ores and ceramic materials for the iron and steel industry.

National Analysis Centre for Iron and Steel (NACIS)

National Analysis Centre for Iron and Steel is a research and development centre of analysis and test technology for iron and steel. Based in the Central Iron and Steel Research Institute in Beijing, China, NACIS has over fifty years experience in research of a wide variety of reference materials and production of metal alloy, ore, ferrous alloy certified reference materials (CRMs).

EURONORM certified reference materials

EURONORM certified reference materials for the chemical analysis of iron and steel products

EURONORM certified reference materials are prepared under the auspices of the European Committee for Iron and Steel Standardization (ECISS) in a collaboration between the producing organizations in: France: Institute de Recherches de la Sidérurgie (IRSID), Centre de Dévelopement des Industries de Mise en Forme des Matériaux (CTIF), the Federal Republic of Germany: Iron and Steel CRM Working Group comprising Bundesanstalt für Materialforschung und -prüfung (BAM), Max-Planck-Institut für Eisenforschung, Verein Deutscher Eisenhüttenleute (VDEh), the United Kingdom: Bureau of Analysed Samples Limited, Sweden/Finland: Jernkontoret, Swedish Institute for Metals Research. Starting in 1968 EURONORM-CRMs have been analysed by laboratories in the European Community (EC) and further European countries. A number of former national CRMs are also listed which after examination by laboratories in the EC they have been accepted as EURONORM-CRMs.
Approximately 20 laboratories take part in the analysis. Each laboratory is requested to analyse the elements to be determined four times. A statistical evaluation of the laboratory mean values is carried out with respect to their normal distribution and the identification of any outlying values.
The finely divided EURONORM-CRMs are supplied in glass bottles containing 100 g. Some EURONORM-CRMs are also available in solid form (discs). Samples in the form of chips, pins and balls with certified oxygen and nitrogen content are also available.

Types of material
The following types of material are available as EURONORM-CRMs:

Unalloyed steels (0), alloyed steels (1), highly alloyed steels (2), special alloys (3), cast iron (4), ferro-alloys (5), ores (6), ceramics (7) and slags (8).

The system of numbering of the samples allows an easy reference to the type of material. The first digit of the sample number shows the type of material (0 - unalloyed steel, 1 - low alloyed steel, 2 - highly alloyed steel etc.). The second and third digit characterises the single sample. Another digit, separated by a hyphen gives the number of editions of the material.

Content of the Euronorm certificate
On the head of the certificate the EURONORM-number and the type of material is given. The mean values of the laboratories involved in the certification campaign are given in a table together with indicative values. The mean values of the accepted data sets, their standard deviations and the standard deviations of the laboratories are also given in the table. The sign "-" in the table stands for an outlier pointed out by statistical tests. The certified values are given in a second table together with their uncertainties (95%-level) or standard deviations. Additionally the following information is given: The owner of the material, a characterisation of the sample (e.g. grain size, dimensions of compact samples), the laboratories involved in the certification campaign, the analytical methods used for element determination, sources for additional information published by ECISS/EGKS.

The use of reference materials

Reference materials are instrumental in ensuring the reliability of analytical measurements and so ensuring that decisions are based on reliable data. When choosing a matrix reference material for a particular application the analyst should consider the following factors before selecting a material:
When choosing a matrix reference material for a particular application the analyst should consider the following factors before selecting a material:

- Matrix match and potential interferences
- Analytes
- Measurement range
- Measurement uncertainties
- Certification procedures used by the producer
- Documentation supplied with the material (e.g. certificate or report).

About proficiency testing (PT)

Proficiency testing (PT) is a powerful quality assurance tool for laboratories undertaking analytical measurements. A PT scheme provider distributes test materials on a regular basis to participating laboratories for independent testing.The results are returned to the organiser of the scheme who makes an analysis of the results and provides a report to all the participants.
There are a number of benefits of taking part in a PT scheme:

- Provides laboratories with a mechanism to compare their measurements with others
- Enables laboratories to demonstrate the quality of their results to third parties e.g. customers, regulators and accreditation bodies
- Facilitates the monitoring of trends, over time, in the quality of measurements
- Assists in the evaluation of methods and instrumentation
- Provides support and information to laboratory staff and their customers

The LGC Proficiency Testing Group (incorporating Quality Management Ltd and Aquacheck Ltd) is a major international provider of proficiency testing services. It has over twenty years experience in all aspects of proficiency testing services for laboratories undertaking chemical and microbiological analysis. Schemes of relevance to a wide range of sectors are available and most of them are run on an international basis. All LGC schemes are accredited by the United Kingdom Accreditation Service (UKAS).

Current schemes provided include:

Environmental:

· AQUACHECK - chemical analysis of clean waters, waste waters, sludges, sediments and soils
· QWAS - microbiological assessment of waters, effluents and sludges
· CONTEST - analysis of contaminated soils for a wide range of contaminants

Food:

· QMS - microbiological examination of food and food ingredients
· QDCS - composition and safety testing in the dairy sector
· QMAS - chemical analysis of meat
· QGS - analysis of gelatine samples
· QCS - microbiological testing of chocolate
· QFCS - chemical testing of food products

Beverage:

· BAPS - chemical, microbiological and sensory analysis of a range of beers.
· DAPS - analysis of a wide range of alcoholic beverages (except beer)
· QBS - microbiological and chemical testing of soft drinks
· SODAS - chemical analysis of carbonated and still soft drinks
· MAPS - analysis of malt and barley used by the malting, brewing and distilling industries
· SUPS - analysis of raw sugar used in soft drink production.

Others:

· QMIS - identification of micro organisms
· PHARMASSURE - measurement of a range of analytes in pharmaceutical products used in hospitals
· DIPS - dissolution proficiency scheme
· QUARTZ - toxicological analysis of drugs in post-mortem blood
· TOYTEST - toy safety testing to the European Standard EN71 and American Standard ASTM F963
· PACQS - particle analysis and characterisation quality scheme

In addition to these regular schemes LGC is able to offer customised or closed proficiency testing schemes tailored to a specific organisation's requirements.
LGC schemes are now available either through LGC Standards or through your local distributor.
Please contact your local LGC Standards office to find out more.

Relevant literature

Applications of Reference Materials in Analytical Chemistry VAM
V. Barwick, S. Burke, R. Lawn, P. Roper and R. Walker RSC

Reference Materials in Analytical Chemistry – A Guide for Selection and Use
A. Zchunke published by Springer-Verlag.

Reference Materials for Chemical Analysis – Certification, Availability and Proper Usage
M. Stoeppler, W.R. Wolf, P.J. Jenks published by Wiley-VCH.

Proficiency Testing in Analytical Chemistry, R.Lawn, M.Thompson and R.Walker published by The Royal Society of Chemistry.

Relevant training courses

A range of training courses is available from LGC to help laboratory managers and analysts demonstrate competence in, and keep abreast of, quality assurance issues and practices. LGC's analytical quality training programme includes:

- Achieving traceability in chemical testing
- Using proficiency testing in the analytical laboratory
- Method validation
- Principles and practice of measurement uncertainty in chemical testing laboratories
- Quality systems in testing laboratories
- Statistics for analytical chemists
- Further statistical tools for analytical chemists
- Evaluating measurement uncertainty for chemical testing laboratories

The majority of the courses are run in Teddington, South West London, UK. In addition, LGC can provide training for groups of staff at your own site, where the courses can be customised to meet your exact needs. For further information, please contact:

Lorraine Didinal
LGC Training Centre
Queens Road
Teddington, Middlesex
TW11 0LY, UK
Tel: +44 (0)20 8943 7631
Fax: +44 (0)20 8943 7314
Email: training@lgc.co.uk
Web: www.lgc.co.uk

General Ordering Information

Prices and delivery procedures are shown in the price list that accompanies this catalogue, or are available from your local LGC Standards sales office. For products requiring special delivery procedures (cooled shipping, dangerous goods, etc) additional charges will be applied.

Please check with your local LGC Standards sales office for detailed procedures and transport charges where applicable.

Unless otherwise agreed in advance and in writing, orders are accepted only against LGC Standards' standard terms and conditions of sale.

Once delivered to the customer, reference substances are not returnable. For this reason it is very important for users to be certain that the product ordered meets their needs.

LGC Standards' technical staff are available to advise on the use and suitability of a particular product. Customers requiring assistance with the use or application of a particular reference substance should contact their local LGC Standards office, contact details are provided at the beginning of this catalogue.

For further information please contact your local office or visit **www.lgcstandards.com**

Iron and steel products

Unalloyed steels

Code	Product	Unit
ECRM-D 030-4	Steel type 60-2 - chips	100 g

Year of issue: 1973

Certified values

C ..... 0.456 ± 0.004 %	S ..... 0.021 ± 0.002 %	As ..... 0.012 ± 0.002 %
Si ..... 0.318 ± 0.007 %	Cr ..... 0.117 ± 0.004 %	Cu ..... 0.061 ± 0.002 %
Mn ..... 0.603 ± 0.004 %	Ni ..... 0.042 ± 0.002 %	N ..... 0.0051 ± 0.0003 %
P ..... 0.018 ± 0.002 %	Al_{total} ..... 0.042 ± 0.006 %	Sn ..... 0.0055 ± 0.0007 %

ECRM-D 031-3	Unalloyed steel - chips	100 g

Year of issue: 1972

Certified values

C ..... 0.055 ± 0.002 %	P ..... 0.014 ± 0.001 %	As ..... 0.013 ± 0.002 %
Si ..... 0.037 ± 0.004 %	S ..... 0.021 ± 0.001 %	Cu ..... 0.020 ± 0.002 %
Mn ..... 0.329 ± 0.007 %	Al_{total} ..... 0.054 ± 0.002 %	N ..... 0.0050 ± 0.0004 %

ECRM-D 032-2	Steel with 0.27% carbon - 0.56% manganese steel - chips	100 g

Year of issue: 1968

Certified values

C ..... 0.271 ± 0.007 %	S ..... 0.0254 ± 0.0010 %	Cu ..... 0.085 ± 0.002 %
Si ..... 0.282 ± 0.007 %	Cr ..... (0.088) %	N ..... 0.0044 ± 0.0009 %
Mn ..... 0.556 ± 0.008 %	Ni ..... (0.040) %	Sn ..... (0.006) %
P ..... 0.0129 ± 0.0007 %	As ..... 0.020 ± 0.002 %	

(Values in parenthesis are indicative values)

ECRM-D 035-2	1.3% Carbon steel - powder	100 g

Year of issue: 1998

Certified values

C ..... 1.277 ± 0.005 %	Cr ..... 0.0104 ± 0.0003 %	As ..... 0.0017 ± 0.0001 %
Si ..... 0.216 ± 0.004 %	Mo ..... 0.0056 ± 0.0002 %	Cu ..... 0.0085 ± 0.0002 %
Mn ..... 0.305 ± 0.002 %	Ni ..... 0.0190 ± 0.0004 %	N ..... 0.0230 ± 0.0004 %
P ..... 0.0038 ± 0.0003 %	Al_{total} ..... 0.0193 ± 0.0005 %	Ti ..... 0.0030 ± 0.0001 %
S ..... 0.0111 ± 0.0003 %	$Al_{acid\text{-}sol.}$ ..... 0.0177 ± 0.0004 %	

ECRM-D 035-2-D	1.3% Carbon steel - disc (38 mm x 20 mm)	disc
ECRM-D 036-1	Tool steel C85 W2, no. 1.1630 - chips	100 g

Year of issue: 1968

Certified values

C ..... 0.858 ± 0.008 %	Cr ..... (0.091) %	N ..... 0.0100 ± 0.0008 %
Si ..... 0.194 ± 0.005 %	Ni ..... (0.058) %	Sn ..... (0.006) %
Mn ..... 0.327 ± 0.010 %	Al_{total} ..... (0.015) %	V ..... (0.019) %
P ..... 0.0074 ± 0.0009 %	As ..... 0.0233 ± 0.0007 %	
S ..... 0.0095 ± 0.0009 %	Cu ..... 0.065 ± 0.005 %	

(Values in parenthesis are indicative values)

ECRM-D 039-2	Free cutting steel with 0.2% lead- chips	100 g

Year of issue: 1971

Certified values

C ..... 0.107 ± 0.003 %	S ..... 0.310 ± 0.005 %	Cu ..... 0.117 ± 0.006 %
Si ..... 0.011 ± 0.002 %	Cr ..... 0.048 ± 0.003 %	N ..... 0.0113 ± 0.0004 %
Mn ..... 1.274 ± 0.014 %	Ni ..... 0.051 ± 0.003 %	Pb ..... 0.207 ± 0.005 %
P ..... 0.083 ± 0.004 %	As ..... 0.018 ± 0.001 %	Sn ..... 0.016 ± 0.001 %

ECRM-D 042-1	0.05% Niobium steel- chips	100 g

Year of issue: 1972

Certified values

C ..... 0.108 ± 0.003 %	S ..... 0.024 ± 0.024 %	Cu ..... 0.041 ± 0.002 %
Si ..... 0.037 ± 0.005 %	Cr ..... 0.016 ± 0.004 %	N ..... 0.0078 ± 0.0007 %
Mn ..... 0.666 ± 0.010 %	Ni ..... 0.029 ± 0.002 %	Nb ..... 0.054 ± 0.005 %
P ..... 0.0057**R** ± 0.0004 %	Al ..... 0.010 ± 0.001 %	

R: revised value

ECRM-D 077-2	Steel X 60 with 0.06% vanadium- chips	100 g

Certified values

C ..... 0.151 ± 0.004 %	Cr ..... (0.016) %	Cu ..... (0.029) %
Si ..... 0.293 ± 0.008 %	Mo ..... (0.003) %	N ..... 0.0054 ± 0.0005 %
Mn ..... 1.28 ± 0.02 %	Ni ..... (0.021) %	Sn ..... (0.003) %
P ..... 0.022 ± 0.001 %	Al ..... 0.034 ± 0.002 %	V ..... 0.058 ± 0.003 %
S ..... 0.014 ± 0.001 %	As ..... 0.007 ± 0.001 %	

(Values in parenthesis are indicative values)

Iron and steel products

Code	Product	Unit
ECRM-D 079-2	Free cutting steel - chips	100 g

Certified values

C ..... 0.596 ± 0.006 %	Cr ..... 0.0382 ± 0.0023 %	N ..... 0.0074 ± 0.0005 %
Si ..... 0.247 ± 0.006 %	Ni ..... 0.0219 ± 0.0010 %	Sn ..... 0.0037 ± 0.0008 %
Mn ..... 0.743 ± 0.013 %	Al ..... 0.0209 ± 0.0017 %	Ti ..... (0.0021) %
P ..... 0.0234 ± 0.0012 %	As ..... 0.0040 ± 0.0007 %	
S ..... 0.192 ± 0.006 %	Cu ..... 0.0462 ± 0.0010 %	

(Values in parenthesis are indicative values)

ECRM-D 082-1	Free cutting steel - chips	100 g

Year of issue:1976

Certified values

C ..... 0.415 ± 0.003 %	Cr ..... 0.018 ± 0.001 %	N ..... (0.0047) %
Si ..... 0.235 ± 0.005 %	Ni ..... 0.027 ± 0.001 %	Pb ..... 0.149 ± 0.004 %
Mn ..... 0.769 ± 0.008 %	Al ..... 0.032 ± 0.002 %	Te ..... 0.030 ± 0.001 %
P ..... 0.013 ± 0.001 %	As ..... (0.029) %	
S ..... 0.030 ± 0.001 %	Cu ..... 0.025 ± 0.001 %	

(Values in parenthesis are indicative values)

ECRM-D 083-1	Unalloyed steel - chips	100 g

Year of issue:1978

Certified values

C ..... 0.0262R ± 0.0003 %*	Cr ..... (0.0129) %	Cu ..... 0.016 ± 0.001 %
Mn ..... 0.289 ± 0.004 %	Ni ..... 0.014 ± 0.001 %	N ..... 0.0022 ± 0.0003 %
P ..... 0.0077 ± 0.0009 %	Al ..... (0.0044) %	
S ..... 0.0100 ± 0.0005 %	As ..... (0.0043) %	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-B 051-1	0.1% Sulfur carbon steel - chips	100 g

Year of issue: 1970

Certified values

C ..... 0.181 %	P ..... (0.025) %	Ni ..... (0.14) %
Si ..... (0.11) %	S ..... 0.126 %	Cu ..... (0.15) %
Mn ..... 1.18 %	Cr ..... (0.05) %	

(Values in parenthesis are indicative values)

ECRM-B 054-1	0.09% Phosphorus carbon steel - chips	100 g

Year of issue: 1975

Certified values

C ..... 0.22 %	P ..... 0.092 %	Ni ..... (0.14) %
Si ..... (0.05) %	S ..... (0.10) %	Cu ..... (0.21) %
Mn ..... (0.88) %	Cr ..... (0.17) %	

(Values in parenthesis are indicative values)

ECRM-B 055-1	0.5% Carbon steel - chips	100 g

Year of issue: 1972

Certified values

C ..... 0.51 %	P ..... 0.016 %	Ni ..... (0.12) %
Si ..... 0.24 %	S ..... 0.036 %	Cu ..... (0.15) %
Mn ..... 0.77 %	Cr ..... (0.16) %	

(Values in parenthesis are indicative values)

ECRM-B 056-1	0.8% Carbon steel - chips	100 g

Year of issue: 1967

Certified values

C ..... 0.79 %	P ..... 0.043 %	Ni ..... (0.13) %
Si ..... 0.30 %	S ..... 0.030 %	Cu ..... (0.12) %
Mn ..... 1.02 %	Cr ..... (0.11) %	

(Values in parenthesis are indicative values)

ECRM-B 057-2	0.05% Carbon steel (BS/DIN EN 10130) - chips	100 g

Year of issue: 1999

Certified values

C ..... 0.0507 ± 0.0009* %	S ..... 0.0127 ± 0.0003* %	$Al_{acid\ sol}$ ..... (0.056) %
Si ..... (0.003) %	Cr ..... 0.0114 ± 0.0003* %	Cu ..... 0.0146 ± 0.0002* %
Mn ..... 0.246 ± 0.002* %	Ni ..... 0.0096 ± 0.0004* %	N ..... 0.0023 ± 0.0001* %
P ..... 0.0120 ± 0.0003* %	Al_{total} ..... 0.059 ± 0.001* %	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-B 057-2-D	0,05% Carbon steel (BS/DIN EN 10130) - disc (35-39 mm x 20-35 mm)	disc

Code	Product	Unit
ECRM-B 058-2	0.15% Sulfur steel (BS 1429) - chips	100 g

Year of issue: 2002

Certified values

C ..... 0.424 ± 0.002 %	S ..... 0.1712 ± 0.0013* %	As ..... 0.0095 ± 0.0005* %
Si ..... 0.1080 ± 0.0012* %	Cr ..... 0.1211 ± 0.0010* %	Cu ..... 0.261 ± 0.002* %
Mn ..... 1.186 ± 0.005* %	Mo ..... 0.0589 ± 0.0007* %	N ..... 0.0107 ± 0.0002* %
P ..... 0.0098 ± 0.0003* %	Ni ..... 0.199 ± 0.002* %	

* 95%-confidence interval

ECRM-B 058-2-D	0,15% Sulfur steel (BS 1429) - disc (35-39 mm x 20-35 mm)	disc
ECRM-B 059-2	0.7% Carbon steel (BS EN 10277) - chips	100 g

Year of issue: 2002

Certified values

C ..... 0.721 ± 0.003* %	S ..... 0.0084 ± 0.0003* %	Al_{total} ..... 0.00044 ± 0.00008* %
Si ..... 0.188 ± 0.002* %	Cr ..... 0.0090 ± 0.0003* %	$Ala_{cid\ sol.}$ .. 0.00020 ± 0.00006* %
Mn ..... 0.495 ± 0.003* %	Mo ..... 0.0018 ± 0.0002* %	Cu ..... 0.0074 ± 0.0001* %
P ..... 0.0046 ± 0.0002* %	Ni ..... 0.0198 ± 0.0006* %	N ..... 0.0051 ± 0.0002* %

* 95%-confidence interval

ECRM-B 059-2-D	0.7% Carbon steel (BS EN 10277) - disc (35-39 mm x 20-35 mm)	disc
ECRM-B 060-1	0.1% Carbon steel - chips	100 g

Year of issue: 1975

Certified values

C ..... 0.122 %	S ..... (0.031) %	Cu ..... (0.060) %
Si ..... (0.17) %	Cr ..... (0.028) %	N ..... 0.0040 %
Mn ..... 0.45 %	Ni ..... (0.039) %	
P ..... (0.024) %	Al_{total} ..... (0.004) %	

(Values in parenthesis are indicative values)

ECRM-B 061-1	0.2% Carbon steel - chips	100 g

Year of issue: 1968

Certified values

C ..... 0.210 %	P ..... (0.019) %	Cu ..... (0.10) %
Si ..... 0.12 %	S ..... (0.034) %	
Mn ..... (0.61) %	Ni ..... (0.21) %	

(Values in parenthesis are indicative values)

ECRM-B 063-1	1.2% Carbon steel - chips	100 g

Year of issue: 1972

Certified values

C ..... 1.26 %	P ..... 0.019 %	Ni ..... (0.10) %
Si ..... 0.24 %	S ..... 0.022 %	Cu ..... (0.09) %
Mn ..... 0.30 %	Cr ..... (0.16) %	N ..... (0.005) %

(Values in parenthesis are indicative values)

ECRM-B 064-1	Nb/Ti Interstitial free steel (EN 10130 and EN 10142) - chips	100 g

Year of issue: 2002

Certified values

C ..... 0.0026 ± 0.0002 %*	Ni ..... 0.0115 ± 0.0003 %*	Nb ..... 0.0146 ± 0.0003 %*
Si ..... 0.0065 ± 0.0006 %*	Al_{total} ..... 0.0330 ± 0.0006 %*	Pb ..... 0.00018 ± 0.00002 %*
Mn ..... 0.1641 ± 0.0011 %*	$Al_{acid\ sol.}$ ..... 0.0302 ± 0.0004 %*	Sn ..... 0.00051 ± 0.00005 %*
P ..... 0.0091 ± 0.0003 %*	As ..... 0.0036 ± 0.0002 %*	Ti ..... 0.0189 ± 0.0003 %*
S ..... 0.0104 ± 0.0003 %*	Co ..... 0.0027 ± 0.0001 %*	V ..... 0.00015 ± 0.00006 %*
Cr ..... 0.0184 ± 0.0004 %*	Cu ..... 0.0077 ± 0.0002 %*	W ..... (0.00022) %
Mo ..... 0.00077 ± 0.00007 %*	N ..... 0.0026 ± 0.0001 %*	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-B 064-1-D	Nb/Ti Interstitial free steel (EN 10130 and EN 10142) - disc (35-39 mm x 20-35 mm)	disc
ECRM-B 084-1	Unalloyed steel - chips	100 g

Year of issue: 1979

Certified values

C ..... 0.391 ± 0.005 %	P ..... 0.018 ± 0.001 %	Ni ..... 0.154 ± 0.004 %
Si ..... 0.265 ± 0.004 %	S ..... 0.029 ± 0.001 %	Cu ..... 0.267 ± 0.004 %
Mn ..... 0.860 ± 0.011 %	Mo ..... 0.033 ± 0.002 %	Sn ..... 0.023 ± 0.003 %

(Values in parenthesis are indicative values)

ECRM-B 085-1	Unalloyed steel - chips	100 g

Year of issue: 1977

Certified values

C ..... 0.067 ± 0.002 %	S ..... 0.336 ± 0.008 %	V ..... 0.0021 ± 0.0007 %
Si ..... 0.008 ± 0.001 %	Co ..... 0.019 ± 0.001 %	Sb ..... 0.0073 ± 0.0005 %
Mn ..... 0.977 ± 0.015 %	Cu ..... 0.291 ± 0.008 %	Zn ..... 0.0025 ± 0.0006 %
P ..... 0.062 ± 0.002 %	Pb ..... 0.0010 ± 0.0001 %	

ECRM-B 085-1-D	Unalloyed steel - disc (35-39 mm x 20-35 mm)	disc

Iron and steel products

Code	Product	Unit
ECRM-B 086-1	Unalloyed steel - chips	100 g

Year of issue: 1978

Certified values

C ..... 0.297 ± 0.005 %	S ..... 0.037 ± 0.001 %	Cu ..... 0.320 ± 0.007 %
Si ..... 0.206 ± 0.006 %	Cr ..... 0.150 ± 0.006 %	Sn ..... 0.026 ± 0.002 %
Mn ..... 0.879 ± 0.010 %	Ni ..... 0.168 ± 0.003 %	
P ..... 0.024 ± 0.001 %	As ..... 0.023 ± 0.002 %	

ECRM-B 086-1-D	Unalloyed steel - disc (35-39 mm x 20-35 mm)	disc
ECRM-B 087-1	Unalloyed steel - chips	100 g

Year of issue: 1980

Certified values

C ..... 0.174 ± 0.004 %	Cr ..... 0.078 ± 0.003 %	Cu ..... 0.171 ± 0.004 %
Si ..... 0.263 ± 0.004 %	Mo ..... 0.021 ± 0.002 %	Sn ..... 0.017 ± 0.001 %
Mn ..... 0.671 ± 0.006 %	Ni ..... 0.118 ± 0.003 %	Sb ..... 0.0046 ± 0.0004 %
P ..... 0.010 ± 0.001 %	As ..... 0.024 ± 0.002 %	
S ..... 0.046 ± 0.002 %	Co ..... 0.015 ± 0.001 %	

ECRM-B 090-1	1% Carbon steel - chips	100 g

Year of issue: 1983

Certified values

C ..... 1.054 ± 0.005 %*	Ni ..... 0.053 ± 0.002 %*	Ga ..... 0.00228 ± 0.00020 %*
Si ..... 0.281 ± 0.003 %*	N ..... 0.0146 ± 0.0002 %*	Hg ..... (< 0.000010) %
Mn ..... 0.226 ± 0.002 %*	Nb ..... 0.00043 ± 0.00004 %*	Sb ..... 0.00090 ± 0.00008 %*
P ..... 0.0128 ± 0.0003 %*	Pb ..... 0.00239 ± 0.00006 %*	Se ..... (£ 0.0002) %
S ..... 0.0095 ± 0.0003 %*	V ..... 0.204 ± 0.006 %*	Te ..... < 0.0002 %
Cr ..... 0.121 ± 0.003 %*	Bi ..... < 0.00002 %	Tl ..... < 0.0001 %
Mo ..... 0.0089 ± 0.0004 %*	Cd ..... < 0.00002 %	Zn ..... 0.00209 ± 0.00009 %*

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-B 090-1-D	1% Carbon steel - disc (35-39 mm x 20-35 mm)	disc
ECRM-B 091-1	0.5% Carbon steel - chips	100 g

Year of issue: 1983

Certified values

C ..... 0.518 ± 0.004 %	Mo ..... 0.098 ± 0.003 %	N ..... 0.0111 ± 0.0005 %
Cr ..... 0.312 ± 0.009 %	Ni ..... 0.310 ± 0.007 %	

ECRM-B 096-1	Low sulfur low calcium steel - chips	100 g

Year of issue: 1984

Certified values

C ..... 0.113 ± 0.002 %	Cr ..... 0.019 ± 0.001 %	Cu ..... 0.022 ± 0.001 %
Si ..... 0.263 ± 0.006 %	Mo ..... 0.003 ± 0.001 %	Nb ..... 0.029 ± 0.002 %
Mn ..... 1.35 ± 0.01 %	Ni ..... 0.020 ± 0.002 %	V ..... 0.0036 ± 0.0004 %
P ..... 0.019 ± 0.001 %	Al_{total} ..... 0.044 ± 0.002 %	Ca ..... 0.0021 ± 0.0003 %
S ..... 0.0009 ± 0.0002 %	$Al_{acid\ sol.}$ ..... 0.040 ± 0.002 %	

ECRM-B 096-2	Low sulfur low calcium steel (BS EN 10025) - chips	100 g

Year of issue: 1999

Certified values

C ..... 0.105 ± 0.0007 %*	S ..... 0.0016 ± 0.0001 %*	Al_{total} ..... 0.0460 ± 0.0005 %*
Si ..... 0.262 ± 0.002 %*	Cr ..... 0.0243 ± 0.0004 %*	Cu ..... 0.0170 ± 0.0002 %*
Mn ..... 1.320 ± 0.005 %*	Mo ..... 0.0020 ± 0.0002 %*	Nb ..... 0.0252 ± 0.0005 %*
P ..... 0.0128 ± 0.0003 %*	Ni ..... 0.0253 ± 0.0004 %*	Ca ..... 0.0020 ± 0.0001 %*

* 95%-confidence interval

ECRM-B 096-2-D	Low sulfur low calcium steel (BS EN 10025) - disc (35-39 mm x 20-35 mm)	disc
ECRM-F 012-1	Unalloyed steel - chips	100 g

Year of issue: 1958

Certified values

C ..... 0.082 %	P ..... 0.083 %	S ..... 0.255 %

ECRM-F 013-1	Unalloyed steel - chips	100 g

Year of issue: 1959

Certified values

P 0.053	S 0.032

ECRM-F 017-1	Unalloyed steel - chips	100 g

Year of issue: 1968

Certified values

C ..... 0.261 %	P ..... 0.0132**R** %	Ni ..... 0.0852 %
Si ..... 0.266 %	S ..... 0.0225 %	Cu ..... 0.0624 %
Mn ..... 0.7255 %	Cr ..... 0.0444 %	N ..... 0.0091 %

R: revised value

Code	Product	Unit
ECRM-F 021-1	Unalloyed steel - chips Year of issue: 1959 Certified values C ..... 0.243 % Si ..... 0.271 % Mn ..... 1.27 % P ..... 0.0121**R** % Cr ..... 0.125 % Ni ..... 0.255 % Cu ..... 0.167 % **R:** revised value	100 g
ECRM-F 022-1	Unalloyed steel - chips Year of issue: 1964 Certified values C ..... 0.115 % Mn ..... 0.797 % P ..... 0.057 % S ..... 0.300 %	100 g
ECRM-F 023-1	Unalloyed steel with 0.3% lead - chips Year of issue: 1964 Certified values C ..... 0.331 % Si ..... 0.264 % Mn ..... 0.667 % P ..... 0.021 % S ..... 0.0156 % Pb ..... 0.280 %	100 g
ECRM-F 024-1	Unalloyed steel with 0.3% lead - chips Year of issue: 1964 Certified values C ..... 0.104 % Si ..... 0.139 % Mn ..... 0.726 % P ..... 0.0155**R** % S ..... 0.235 % Pb ..... 0.287 % **R:** revised value	100 g
ECRM-F 080-1	Unalloyed steel - chips Year of issue: 1973 Certified values C ..... 0.452 ± 0.003 % Si ..... 0.317 ± 0.006 % Mn ..... 1.116 ± 0.012 % P ..... 0.028 ± 0.001 % S ..... 0.024 ± 0.001 % Cr ..... 0.025 ± 0.002 % N ..... 0.0073 ± 0.0005 %	100 g
ECRM-F 081-1	Unalloyed steel - chips Year of issue: 1974 Certified values C ..... 0.099 ± 0.002 % Si ..... 0.105 ± 0.003 % Mn ..... 0.605 ± 0.006 % P ..... 0.0129R± 0.0006 % S ..... 0.014 ± 0.001 % Ni ..... 0.042 ± 0.002 % Al_{total} ..... 0.023 ± 0.001 % Co ..... 0.017 ± 0.004 % Cu ..... 0.026 ± 0.001 % **R:** revised value	100 g

Alloy steels

Code	Product	Unit
ECRM-D 126-1	Tool steel 90MnCrV8, No. 1.2842 - chips Year of issue:1963 Certified values C ..... 0.841 ± 0.008 % Si ..... (0.241) % Mn ..... 1.817 ± 0.009 % P ..... 0.0092 ± 0.0011 % S ..... 0.0050 ± 0.0007 % Cr ..... 0.317 ± 0.009 % Ni ..... (0.038) % Cu ..... (0.098) % V ..... 0.143 ± 0.004 % Te ..... (0.0002) % (Values in parenthesis are indicative values)	100 g
ECRM-D 128-1	Structural steel with 0.9% Ti, No. 1.5310 - chips Year of issue:1972 Certified values C ..... 0.085 ± 0.003 % Si ..... 0.949 ± 0.010 % Mn ..... 0.839 ± 0.010 % P ..... 0.007 ± 0.001 % S ..... 0.007 ± 0.001 % Cr ..... 0.108 ± 0.003 % Ni ..... 0.046 ± 0.006 % Al ..... 0.286 ± 0.010 % Cu ..... 0.055 ± 0.003 % N ..... (0.0024) % Ti ..... 0.890 ± 0.013 % V ..... (0.008) % (Values in parenthesis are indicative values)	100 g
ECRM-D 130-1	Rail steel - chips Year of issue:1968 Certified values C ..... 0.546 ± 0.005 % Si ..... 0.313 ± 0.006 % Mn ..... 1.593 ± 0.009 % P ..... 0.0209 ± 0.0017 % S ..... 0.0158 ± 0.0011 % Cr ..... (0.032) % Ni ..... (0.031) % Al ..... 0.0037 ± 0.0005 % $Al_{acid\ sol.}$ ..... 0.0019 ± 0.0006 % As ..... 0.0167 ± 0.0011 % Cu ..... 0.072 ± 0.003 % N ..... 0.0093 ± 0.0008 % Sn ..... (0.006) % V ..... (0.003) % (Values in parenthesis are indicative values)	100 g

Code	Product	Unit
ECRM-D 179-2	Tool steel 60 WCrV 7, No. 1.2550 - chips	100 g

Year of issue:1990

Certified values

C ..... 0.598 ± 0.009 %	Cu ..... 0.111 ± 0.004 %	Ga ..... 0.00129 ± 0.00012 %
Si ..... 0.579 ± 0.011 %	N ..... 0.0068 ± 0.0005 %	Hg ..... (< 0.00001) %
Mn ..... 0.539 ± 0.010 %	Nb ..... 0.00144 ± 0.00013 %	Sb ..... 0.00175 ± 0.00010 %
P ..... 0.0267 ± 0.0024 %	Pb ..... 0.00013 ± 0.00002 %	Se ..... (< 0.00020) %
S ..... (0.0006) %	Ti ..... (0.0014) %	Te ..... < 0.00020 %
Cr ..... 1.08 ± 0.03 %	V ..... 0.188 ± 0.007 %	Tl ..... (< 0.000035) %
Mo ..... 0.070 ± 0.006 %	W ..... 1.87 ± 0.05 %	Zn ..... 0.00023 ± 0.00004 %
Ni ..... 0.078 ± 0.007 %	Bi ..... < 0.00003 %	
Co ..... (0.015) %	Cd ..... < 0.00003 %	

(Values in parenthesis are indicative values)

ECRM-D 179-2-D	Tool steel 60 WCrV 7, No. 1.2550 - disc (35-39 mm x 20-35 mm)	disc
ECRM-D 180-1	Low alloyed steel - chips	100 g

Year of issue:1973

Certified values

C ..... 0.197 ± 0.005 %	S ..... 0.0249 ± 0.0010 %	Cu ..... 0.115 ± 0.004 %
Si ..... 0.362 ± 0.007 %	Cr ..... 1.250 ± 0.018 %	N ..... 0.0068 ± 0.0009 %
Mn ..... 1.286 ± 0.015 %	Ni ..... 0.096 ± 0.008 %	
P ..... 0.0174 ± 0.0010 %	As ..... 0.030 ± 0.002 %	

ECRM-D 181-1	Low alloyed steel - chips	100 g

Year of issue:1973

Certified values

C ..... 0.590 ± 0.005 %	Cr ..... 0.126 ± 0.004 %	N ..... 0.0068 ± 0.0005 %
Si ..... 1.054 ± 0.015 %	Ni ..... 0.070 ± 0.004 %	Sn ..... (0.015) %
Mn ..... 1.047 ± 0.008 %	Al ..... 0.022 ± 0.004 %	Sb ..... (0.004) %
P ..... 0.018 ± 0.001 %	As ..... (0.026) %	
S ..... 0.035 ± 0.001 %	Cu ..... 0.174 ± 0.005 %	

(Values in parenthesis are indicative values)

ECRM-D 182-1	Tool steel 80 CrV 2, No. 1.2235 - chips	100 g

Year of issue:1974

Certified values

C ..... 0.790 ± 0.008 %	Ni ..... 0.152 ± 0.005 %	Sn ..... (0.0135) %
Si ..... 0.368 ± 0.014 %	Al ..... 0.020 ± 0.003 %	V ..... 0.177 ± 0.010 %
Mn ..... 0.389 ± 0.007 %	As ..... (0.0202) %	Mg ..... (0.0005) %
P ..... 0.0076**R** ± 0.0005 %	Cu ..... 0.141 ± 0.004 %	Sb ..... 0.0042 ± 0.0005 %
S ..... 0.011 ± 0.001 %	N ..... 0.0102 ± 0.0004 %	Zn ..... 0.0015 ± 0.0002 %
Cr ..... 0.591 ± 0.012 %	Pb ..... 0.0039 ± 0.0003 %	

(Values in parenthesis are indicative values)

R: revised value

ECRM-D 183-1	High Copper steel, No. 1.8962 - chips	100 g

Year of issue:1973

Certified values

C ..... 0.083 ± 0.002 %	S ..... 0.031 ± 0.001 %	As ..... (0.013) %
Si ..... 0.421 ± 0.006 %	Cr ..... 0.670 ± 0.013 %	Cu ..... 0.445 ± 0.010 %
Mn ..... 0.354 ± 0.004 %	Ni ..... 0.073 ± 0.004 %	N ..... 0.0064 ± 0.0006 %
P ..... 0.089 ± 0.002 %	Al ..... 0.027 ± 0.002 %	

(Values in parenthesis are indicative values)

ECRM-D 184-1	Low alloyed steel 35 NiCrMoV 14 6 - chips	100 g

Year of issue:1978

Certified values

C ..... 0.333 ± 0.003 %	Mo ..... 0.457 ± 0.009 %	N ..... 0.0051 ± 0.0004 %
Si ..... 0.218 ± 0.005 %	Ni ..... 3.318 ± 0.015 %	Sn ..... 0.0044 ± 0.0004 %
Mn ..... 0.528 ± 0.006 %	Al ..... 0.0052 ± 0.0007 %	V ..... 0.108 ± 0.006 %
P ..... 0.0047**R** ± 0.0003 %	As ..... 0.0180 ± 0.0011 %	Sb ..... (0.0015) %
S ..... 0.0032 ± 0.0003 %	Co ..... 0.0560 ± 0.0019 %	
Cr ..... 1.287 ± 0.011 %	Cu ..... 0.060 ± 0.002 %	

(Values in parenthesis are indicative values

R: revised value

ECRM-D 187-1	Low alloyed boron steel - chips	100 g

Year of issue:1982

Certified values

C ..... 0.195 ± 0.003 %	Cr ..... 1.186 ± 0.015 %	B ..... 0.0004 ± 0.0002 %
Si ..... 0.026 ± 0.002 %	Mo ..... 0.035 ± 0.002 %	Co ..... 0.014 ± 0.001 %
Mn ..... 1.354 ± 0.011 %	Ni ..... 0.096 ± 0.003 %	Cu ..... 0.161 ± 0.003 %
P ..... 0.014 ± 0.001 %	Al ..... 0.046 ± 0.002 %	N ..... 0.014 ± 0.001 %
S ..... 0.025 ± 0.001 %	As ..... 0.018 ± 0.002 %	Sn ..... 0.011 ± 0.001 %

Code	Product	Unit
ECRM-D 191-1	3% Si-Stahl - disc (35-39 mm x 20-35 mm)	disc

Year of issue:1986

Certified values

C ..... 0.013 ± 0.002 %	Cr..... 0.025 ± 0.002 %	Cu ..... 0.0080 ± 0.0006 %
Si..... 3.140 ± 0.022 %	Mo ..... (0.0021) %	N ..... 0.0026 ± 0.0003 %
Mn..... 0.025 ± 0.002 %	Ni..... 0.018 ± 0.002 %	Ti..... 0.009 ± 0.002 %
P ..... 0.011 ± 0.001 %	Al ..... 0.397 ± 0.015 %	
S ..... 0.0017 ± 0.0003 %	As ..... 0.0031 ± 0.0006 %	

(Values in parenthesis are indicative values)

ECRM-D 191-2	Dynamo steel, material number: 1.0812 - chips	100 g

Year of issue:2006

Certified values

C ..... 0.0043 ± 0.0002 %*	Cr..... 0.0314 ± 0.0006 %*	Cu ..... 0.0165 ± 0.0003 %*
Si..... 3.267 ± 0.012 %*	Mo ..... 0.0020 ± 0.0002 %*	N ..... 0.00105 ± 0.00009 %*
Mn..... 0.1334 ± 0.0019 %*	Ni..... 0.0224 ± 0.0004 %*	Sn ..... 0.0050 ± 0.0005 %*
P ..... 0.0087 ± 0.0004 %*	Al ..... 0.985 ± 0.006 %*	Ti..... 0.0024 ± 0.0002 %*
S ..... 0.0029 ± 0.0002 %*	As ..... 0.0018 ± 0.0003 %*	Sb ..... (0.0007) %

* 95%-confidence interval

ECRM-D 192-1	Reactor steel, No. 1.6310 - chips	100 g

Year of issue:1995

Certified values

C ..... 0.1875 ± 0.0009 %*	Mo ..... 0.482 ± 0.004 %*	Co ..... 0.0055 ± 0.0002 %*
Si..... 0.219 ± 0.004 %*	Ni..... 0.755 ± 0.004 %*	Cu ..... 0.0453 ± 0.0008 %*
Mn..... 1.377 ± 0.006 %*	Al ..... 0.0308 ± 0.0008 %*	N ..... 0.0118 ± 0.0002 %*
P ..... 0.0029 ± 0.0002 %*	$Al_{acid\ sol.}$ ..... 0.0285 ± 0.0008 %*	Sn ..... (0.0030) %
S ..... 0.0010 ± 0.0001 %*	As ..... (0.003) %	Ti..... (0.0009) %
Cr ..... 0.0717 ± 0.0018 %*	B ..... (0.00016) %	V ..... (0.003) %

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-D 192-1-D	Reactor steel, No. 1.6310 - disc (35-39 mm x 20-35 mm)	disc
ECRM-D 193-1	Reactor steel - chips	100 g

Year of issue:1990

Certified values

C ..... 0.139 ± 0.004 %	Mo ..... 0.347 ± 0.011 %	Cu ..... 0.598 ± 0.009 %
Si..... 0.404 ± 0.006 %	Ni..... 1.178 ± 0.019 %	N ..... 0.0108 ± 0.0004 %
Mn..... 0.972 ± 0.017 %	Al ..... 0.0257 ± 0.0015 %	Nb ..... 0.0232 ± 0.0019 %
P ..... 0.0063 ± 0.0006 %	As ..... 0.0062 ± 0.0007 %	Pb ..... (0.0002) %
S ..... 0.0086 ± 0.0006 %	B ..... (0.0002) %	Ti..... (0.0013) %
Cr ..... 0.182 ± 0.006 %	Co..... 0.0073 ± 0.0007 %	V ..... (0.0019) %

(Values in parenthesis are indicative values)

ECRM-D 193-1-D	Reactor steel - disc (40 mm x 35 mm)	disc
ECRM-D 194-1	Low sulfur steel - chips	100 g

Year of issue:1993

Certified values

C ..... 0.1532 ± 0.0011 %*	Cr..... 0.733 ± 0.006 %*	B ..... 0.0020 ± 0.0002 %*
Si..... 0.431 ± 0.004 %*	Mo ..... 0.2857 ± 0.0026 %*	Cu ..... 0.0751 ± 0.0011 %*
Mn..... 1.188 ± 0.004 %*	Ni..... 0.3417 ± 0.0027 %*	N ..... 0.0115 ± 0.0002 %*
P ..... 0.0097 ± 0.0006 %*	Al ..... 0.0837 ± 0.0020 %*	V ..... 0.0243 ± 0.0009 %*
S ..... 0.00059**R** ± 0.00005 %*	As ..... 0.0042 ± 0.0004 %*	Ca ..... 0.0026 ± 0.0002 %*

R: revised value
* 95%-confidence interval

ECRM-D 194-1-D	Low sulfur steel - disc (35 mm x 35 mm)	disc
ECRM-B 151-1	Low-carbon high silicon steel - chips	100 g

Year of issue: 1966

Certified values

C ..... 0.028 %	Mn ..... 0.085 %	S ..... (0.025) %
Si..... 3.49 %	P ..... 0.015 %	

(Values in parenthesis are indicative values)

ECRM-B 152-1	Manganese-molybdenum steel - chips	100 g

Year of issue: 1968

Certified values

C ..... 0.39 %	S ..... 0.043 %	Cu ..... 0.21 %
Si..... 0.18 %	Cr..... 0.09 %	V ..... (<0.01) %
Mn..... 1.61 %	Mo ..... 0.26 %	
P ..... 0.032 %	Ni..... 0.15 %	

(Values in parenthesis are indicative values)

Code	Product	Unit
ECRM-B 153-1	Nickel-chromium-molybdenum steel - chips	100 g

Year of issue: 1977

Certified values

C ..... 0.315 %	S ..... 0.027 %	Al ..... (0.003) %
Si ..... 0.079 %	Cr ..... 0.66 %	Cu ..... 0.088 %
Mn ..... 0.81 %	Mo ..... 0.58 %	Sn ..... 0.011 %
P ..... 0.011 %	Ni ..... 2.55 %	

(Values in parenthesis are indicative values)

ECRM-B 154-1	3% Nickel steel - chips	100 g

Year of issue: 1964

Certified values

C ..... (0.31) %	P ..... (0.020) %	Mo ..... (0.029) %
Si ..... (0.22) %	S ..... (0.009) %	Ni ..... 3.54 %
Mn ..... (0.62) %	Cr ..... (0.05) %	Cu ..... (0.14) %

(Values in parenthesis are indicative values)

ECRM-B 155-1	Nickel-chromium-molybdenum steel - chips	100 g

Year of issue: 1963

Certified values

C ..... 0.40 %	S ..... 0.012 %	As ..... (0.04) %
Si ..... 0.23 %	Cr ..... 1.08 %	Cu ..... (0.17) %
Mn ..... 0.56 %	Mo ..... 0.34 %	V ..... (<0.01) %
P ..... 0.019 %	Ni ..... 1.43 %	

(Values in parenthesis are indicative values)

ECRM-B 186-1	Alloy steel - chips	100 g

Year of issue: 1981

Certified values

C ..... 0.610 ± 0.004 %	S ..... 0.035 ± 0.002 %	Al ..... 0.014 ± 0.001 %
Si ..... 1.72 ± 0.02 %	Cr ..... 0.218 ± 0.010 %	Cu ..... 0.281 ± 0.009 %
Mn ..... 0.870 ± 0.008 %	Mo ..... 0.048 ± 0.003 %	
P ..... 0.022 ± 0.001 %	Ni ..... 0.190 ± 0.003 %	

(Values in parenthesis are indicative values)

ECRM-B 186-1-D	Alloy steel - disc (35-39 mm x 20-35 mm)	disc
ECRM-B 195-1	Chromium-molybdenum-nickel steel - chips	100 g

Year of issue: 1992

Certified values

C ..... 0.756 ± 0.003 %	Mo ..... 0.768 ± 0.004 %*	V ..... 0.312 ± 0.004 %*
Si ..... 0.466 ± 0.004 %*	Ni ..... 0.327 ± 0.004 %*	Ca ..... 0.0017 ± 0.0001 %*
Mn ..... 0.571 ± 0.003 %*	Cu ..... 0.0355 ± 0.0005 %*	Sb ..... (0.0008) %
P ..... 0.0160 ± 0.0006 %*	N ..... 0.0100 ± 0.0002 %*	Te ..... (< 0.0002) %
S ..... 0.0121 ± 0.0003 %*	Pb ..... 0.0010 ± 0.0001 %*	Zn ..... 0.0046 ± 0.0002 %*
Cr ..... 1.566 ± 0.009 %*	Sn ..... (0.002) %	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-B 195-1-D	Chromium-molybdenum-nickel steel - disc (35-39 mm x 20-35 mm)	disc
ECRM-F 102-1	Low alloyed steel - chips	100 g

Year of issue: 1958

Certified values

C ..... 0.389 %	P ..... 0.012 %	Mo ..... 1.20 %
Si ..... 0.281 %	S ..... (0.006) %	Ni ..... 4.40 %
Mn ..... 0.367 %	Cr ..... 0.261 %	Cu ..... 0.169 %

(Values in parenthesis are indicative values)

ECRM-F 106-2	Low alloyed steel - chips	100 g

Year of issue: 1968

Certified values

C ..... 0.153 %	Cr ..... 1.030 %	Cu ..... 0.078 %
Si ..... 0.238 %	Mo ..... 0.054 %	
Mn ..... 0.727 %	Ni ..... 1.430 %	

ECRM-F 107-1	Low alloyed steel - chips	100 g

Year of issue: 1960

Certified values

C ..... 0.407 %	Cr ..... 1.443 %	Al ..... 0.345 %
Si ..... 0.286 %	Mo ..... 0.323 %	Cu ..... 0.108 %
Mn ..... 0.611 %	Ni ..... 0.191 %	

Code	Product	Unit
ECRM-F 108-1	Low alloyed steel - chips	100 g

Year of issue: 1965

Certified values

C ..... 0.384 %	P ..... 0.0176**R** %	Mo ..... 0.538 %
Si ..... 0.340 %	S ..... 0.017 %	Ni ..... 0.215 %
Mn ..... 0.690 %	Cr ..... 2.92 %	Cu ..... 0.118 %

R: revised value

ECRM-F 112-1	Low alloyed steel - chips	100 g

Year of issue: 1963

Certified values

C ..... 0.348 %	Cr ..... 4.78 %	Cu ..... 0.115 %
Si ..... 1.00 %	Mo ..... 1.21 %	V ..... 0.604 %
Mn ..... 0.191 %	Ni ..... 0.234 %	W ..... 1.78 %

ECRM-F 113-1	Low alloyed steel - chips	100 g

Year of issue: 1963

Certified values

C ..... 0.680 %	P ..... (0.013) %	Mo ..... 0.413 %
Si ..... 0.249 %	S ..... (0.006) %	Ni ..... 1.744 %
Mn ..... 0.586 %	Cr ..... 0.816 %	Cu ..... 0.146 %

(Values in parenthesis are indicative values)

ECRM-F 114-1	Low alloyed steel - chips	100 g

Year of issue: 1964

Certified values

C ..... 0.044 %	Mn ..... 0.0655 %	S ..... 0.0037 %
Si ..... 4.00 %	P ..... 0.030 %	

ECRM-F 185-1	Low alloyed steel - chips	100 g

Year of issue: 1981

Certified values

C ..... 1.172 ± 0.005 %	P ..... (0.02) %	Ni ..... (0.17) %
Si ..... (0.25) %	S ..... 0.0209 ± 0.0010 %	Cu ..... (0.17) %
Mn ..... (0.41) %	Cr ..... 0.990 ± 0.011 %	Sn ..... 0.0212 ± 0.0013 %

(Values in parenthesis are indicative values)

ECRM-F 188-1	Low alloyed steel - chips	100 g

Year of issue: 1981

Certified values

C ..... 1.094 ± 0.008 %	Bi ..... < 0.00002 %	Se ..... (< 0.0002) %
S ..... 0.0113 ± 0.0006 %	Cd ..... < 0.00005 %	Te ..... < 0.0002 %
Cr ..... 1.538 ± 0.016 %	Ga ..... 0.00251±0.00017 %*	Tl ..... (< 0.000020) %
Nb ..... 0.00013±0.00003 %*	Hg ..... (< 0.00001) %	Zn ..... (< 0.00031) %
Pb ..... < 0.0001 %	Sb ..... 0.00048±0.00005 %*	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-F 190-1	Low alloyed steel - chips	100 g

Year of issue: 1986

Certified values

C ..... 0.395 ± 0.004 %	S ..... 0.0044 ± 0.0003 %	Co ..... 0.034 ± 0.001 %
Si ..... 0.278 ± 0.015 %	Cr ..... 2.18 ± 0.03 %	N ..... 0.0096 ± 0.0005 %
Mn ..... 1.28 ± 0.02 %	Mo ..... 0.410 ± 0.007 %	
P ..... 0.0112 ± 0.0002 %	Ni ..... 0.934 ± 0.017 %	

ECRM-F 190-1-D	Low alloyed steel - disc (35-39 mm x 20-35 mm)	disc
ECRM-S 196-1	2% Silicium steel - disc (38 mm x 25 mm)	disc

Year of issue: 2000

Certified values

C ..... 0.0039 ± 0.0003 %*	P ..... 0.0076 ± 0.0005 %*	N ..... 0.0020 ± 0.0001 %*
Si ..... 1.908 ± 0.014 %*	S ..... 0.0005 ± 0.0001 %*	Ca ..... 0.0005 ± 0.0001 %*
Mn ..... 0.365 ± 0.003 %*	Al ..... 0.201 ± 0.002 %*	

* 95%-confidence interval

Iron and steel products

Code	Product	Unit
ECRM-S 197-1	Low-alloyed steel, No. 1.7321 Year of issue: 2007 Certified values	100 g

C ..... 0.219 ± 0.002 %*	Ni ..... 0.148 ± 0.003 %*	Pb..... (0.0003) %
Si..... 0.275 ± 0.005 %*	Al ..... 0.0313 ± 0.0014 %*	Sn..... 0.0097 ± 0.0005 %*
Mn ..... 0.792 ± 0.006 %*	$Al_{acid\ sol.}$ ..... (0.0270) %	Ti ..... 0.0005 ± 0.0001 %*
P..... 0.0073 ± 0.0003 %*	As ..... 0.0083 ± 0.0004 %*	V..... (0.0050) %
S..... 0.0232 ± 0.0007 %*	Co ..... 0.0135 ± 0.0003 %*	Bi..... (0.00001) %
Cr ..... 0.451 ± 0.003 %*	Cu ..... 0.152 ± 0.002 %*	Sb..... (0.0018) %
Mo ..... 0.402 ± 0.004 %*	N ..... 0.0114 ± 0.0003 %*	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-S 197-1-D	Low-alloyed steel, No. 1.7321 - disc (38 mm x 25 mm)	disc

Highly alloyed steels

ECRM-D 226-1	Stainless steel, 13.7% chromium no. 1.4034 - chips Year of issue: 1967 Certified values	100 g

C ..... 0.416 ± 0.007 %	Cr..... 13.67 ± 0.06 %	N ..... 0.0362 ± 0.0017 %
Si..... 0.514 ± 0.007 %	Mo..... 0.024 ± 0.006 %	Sn..... (0.0068) %
Mn ..... 0.434 ± 0.013 %	Ni ..... 0.139 ± 0.014 %	V..... 0.022 ± 0.003 %
P..... 0.0207 ± 0.0012 %	As ..... (0.0256) %	
S..... 0.0094 ± 0.0014 %	Co ..... (0.0246) %	

(Values in parenthesis are indicative values)

ECRM-D 227-1	High-speed steel, 4% chromium, 2,6% molybdenum, 2.4% vanadium und 3% tungsten, no. 1.3333 - chips Year of issue: 1971 Certified values	100 g

C ..... 0.950 ± 0.013 %	Cr..... 4.25 ± 0.02 %	Sn..... 0.0251 ± 0.0024 %
Si..... 0.272 ± 0.013 %	Mo..... 2.64 ± 0.05 %	V..... 2.44 ± 0.03 %
Mn ..... 0.236 ± 0.007 %	Ni ..... 0.114 ± 0.008 %	W ..... 3.03 ± 0.06 %
P..... 0.016 ± 0.001 %	Cu ..... 0.124 ± 0.005 %	Ag..... (0.000064) %
S..... 0.022 ± 0.002 %	N ..... 0.040 ± 0.002 %	Sb..... 0.0035 ± 0.0005 %

(Values in parenthesis are indicative values)

ECRM-D 231-2	Stainless steel, 18% chromium and 10% nickel, no. 1.4306 - chips Year of issue: 2002 Certified values	100 g

C ..... 0.0140 ± 0.0003 %*	Ni ..... 10.105 ± 0.021 %*	Pb..... (0.00007) %
Si..... 0.368 ± 0.006 %*	Al ..... 0.0032 ± 0.0004 %*	Sn..... 0.0043 ± 0.0003 %*
Mn ..... 1.263 ± 0.009 %*	As ..... 0.0048 ± 0.0003 %*	Ti..... 0.0007 ± 0.0002 %*
P..... 0.0179 ± 0.0007 %*	B ..... 0.0020 ± 0.0002 %*	V..... 0.0708 ± 0.0008 %*
S..... 0.0250 ± 0.0007 %*	Co ..... 0.0402 ± 0.0011 %*	W ..... 0.0141 ± 0.0010 %*
Cr ..... 18.071 ± 0.018 %*	Cu ..... 0.0941 ± 0.0009 %*	Sb..... 0.0011 ± 0.0001 %*
Mo ..... 0.301 ± 0.004 %*	N ..... 0.0444 ± 0.0004 %*	Ca ..... 0.00074 ± 0.00014 %*

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-D 235-1	Austenitic manganese steel, 12.7% manganese, no. 1.3401 - chips Year of issue: 1972 Certified values	100 g

C ..... 0.912 ± 0.014 %	S ..... 0.0072 ± 0.0007 %	Cu ..... 0.073 ± 0.002 %
Si..... 0.094 ± 0.010 %	Cr..... 0.354 ± 0.014 %	N ..... 0.020 ± 0.0008 %
Mn ..... 12.73 ± 0.07 %	Mo..... 0.032 ± 0.003 %	V..... (0.012) %
P..... 0.045 ± 0.002 %	Ni ..... (0.08) %	

(Values in parenthesis are indicative values)

ECRM-D 237-1	Stainless steel, 17% chromium and 10% nickel, no. 1.4550 - chips Year of issue: 1973 Certified values	100 g

C ..... 0.068 ± 0.002 %	Cr..... 17.24 ± 0.04 %	N ..... 0.035 ± 0.002 %
Si..... 0.482 ± 0.013 %	Mo..... 0.306 ± 0.006 %	Nb ..... 0.660 ± 0.023 %
Mn ..... 1.443 ± 0.018 %	Ni ..... 10.32 ± 0.04 %	V..... 0.057 ± 0.005 %
P..... 0.032 ± 0.002 %	Co ..... 0.221 ± 0.006 %	
S..... 0.012 ± 0.001 %	Cu ..... 0.123 ± 0.005 %	

Code	Product	Unit
ECRM-D 271-1	High-alloyed steel (toolsteel 1.2344) - chips Year of issue: 2006 Certified values	100 g

C ..... 0.3698 ± 0.0021 %*	As ..... 0.0057 ± 0.0004 %*	V ..... 0.850 ± 0.007 %*
Si ..... 0.923 ± 0.006 %*	B ..... (0.0003) %	W ..... 0.0054 ± 0.0005 %*
Mn ..... 0.437 ± 0.004 %*	Co ..... 0.0139 ± 0.0005 %*	Zr ..... (0.00013) %
P ..... 0.0120 ± 0.0004 %*	Cu ..... 0.1371 ± 0.0015 %*	Ca ..... 0.0009 ± 0.0002 %*
S ..... 0.00045 ± 0.00008 %*	N ..... 0.0137 ± 0.0003 %*	Mg ..... (0.00013) %
Cr ..... 5.002 ± 0.019 %*	Nb ..... (0.0009) %	O ..... 0.0020 ± 0.0002+1) %
Mo ..... 1.247 ± 0.006 %*	Pb ..... (0.0005) %	Sb ..... (0.0017) %
Ni ..... 0.1552 ± 0.0020 %*	Sn ..... 0.0084 ± 0.0002 %*	
Al ..... 0.0234 ± 0.0011 %*	Ti ..... 0.0020 ± 0.0002 %*	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-D 271-1-D	High-alloyed steel (toolsteel 1.2344) - disc (37 mm x 25 mm)	disc
ECRM-D 278-1	Stainless steel, 18% chromium, 1% molybdenum and 0,9% carbon, no. 1.4112 - chips Year of issue: 1973 Certified values	100 g

C ..... 0.903 ± 0.019 %	S ..... 0.0052 ± 0.0011 %	Cu ..... 0.077 ± 0.008 %
Si ..... 0.336 ± 0.008 %	Cr ..... 18.11 ± 0.08 %	V ..... 0.077 ± 0.008 %
Mn ..... 0.405 ± 0.006 %	Mo ..... 1.040 ± 0.030 %	
P ..... 0.0154 ± 0.0014 %	Ni ..... 0.236 ± 0.024 %	

ECRM-D 283-1	Highly alloyed steel - chips Year of issue: 1985 Certified values	100 g

C ..... 1.219 ± 0.009 %	Mo ..... 3.41 ± 0.09 %	Pb ..... (< 0.0005) %
Si ..... 0.345 ± 0.017 %	Al ..... 0.0099 ± 0.0014 %	Sn ..... (0.0065) %
Mn ..... 0.217 ± 0.010 %	As ..... (0.0096) %	V ..... 3.28 ± 0.03 %
P ..... 0.022 ± 0.002 %	B ..... 0.0003 ± 0.0001 %	W ..... 9.66 ± 0.12 %
S ..... 0.029 ± 0.002 %	Co ..... 10.27 ± 0.17 %	
Cr ..... 4.15 ± 0.06 %	N ..... 0.033 ± 0.002 %	

(Values in parenthesis are indicative values)

ECRM-D 284-2	Stainless steel, 17% chromium, 11% nickel and 2% molybdenum, no. 1.4571 - chips Year of issue: 2000 Certified values	100 g

C ..... 0.0201 ± 0.0005 %*	Al ..... 0.0027 ± 0.0004 %*	Ti ..... 0.191 ± 0.004 %*
Si ..... 0.537 ± 0.008 %*	As ..... 0.0063 ± 0.0003 %*	V ..... 0.0425 ± 0.0016 %*
Mn ..... 1.745 ± 0.009 %*	B ..... 0.0026 ± 0.0001 %*	W ..... (0.0183) %
P ..... 0.0258 ± 0.0008 %*	Co ..... 0.0525 ± 0.0011 %*	Zr ..... (0.0005) %
S ..... 0.0237 ± 0.0005 %*	Cu ..... 0.1831 ± 0.0014 %*	O ..... 0.0099 ± 0.0007[1] %
Cr ..... 16.811 ± 0.019 %*	N ..... 0.0151 ± 0.0002 %*	Ta ..... (0.0013) %
Mo ..... 2.111 ± 0.010 %*	Nb ..... (0.0028) %	
Ni ..... 10.72 ± 0.05 %*	Sn ..... 0.0047 ± 0.0002 %*	

(Values in parenthesis are indicative values)

* 95%-confidence interval
[1] Oxygen content only certified for the chips

ECRM-D 284-2-D	Stainless steel, 17% chromium, 11% nickel and 2% molybdenum, no. 1.4571 - disc (35-39 mm x 20-35 mm)	disc
ECRM-D 286-1	Stainless steel, 18% chromium, 8.5% nickel, 0.3% molybdenum and 0.3% sulfur, no. 1.4305 - chips Year of issue: 1985 Certified values	100 g

C ..... 0.100 ± 0.005	Mo ..... 0.329 ± 0.009 %	N ..... 0.043 ± 0.002 %
Mn ..... 1.92 ± 0.03 %	Ni ..... 8.54 ± 0.04 %	Pb ..... (0.0003) %
P ..... 0.026 ± 0.002 %	Al ..... (0.0023) %	Sn ..... 0.0084 ± 0.0009 %
S ..... 0.280 ± 0.014 %	B ..... (0.0003) %	O ..... (0.0315) %
Cr ..... 18.13 ± 0.08 %	Co ..... 0.150 ± 0.008 %	Sb ..... 0.0014± 0.0004 %

(Values in parenthesis are indicative values)

ECRM-D 288-1	Steel with 2% C and 12% Cr, no. 1.2436 - chips Year of issue: 1986 Certified values	100 g

C ..... 2.08 ± 0.02 %	Mo ..... 0.103 ± 0.007 %	N ..... 0.0151 ± 0.0004 %
Si ..... 0.260 ± 0.012 %	Ni ..... 0.298 ± 0.007 %	Sn ..... (0.0043) %
Mn ..... 0.292 ± 0.008 %	Al ..... 0.012 ± 0.002 %	Ti ..... 0.020 ± 0.002 %
P ..... 0.024 ± 0.002 %	As ..... (0.0065) %	V ..... 0.055 ± 0.004 %
S ..... (0.0012) %	Co ..... 0.018 ± 0.002 %	W ..... (0.682) %
Cr ..... 12.00 ± 0.08 %	Cu ..... 0.060 ± 0.004 %	Sb ..... (0.0014) %

(Values in parenthesis are indicative values)

ECRM-D 288-1-D	Steel with 2% C and 12% Cr, no. 1.2436 - disc (35-39 mm x 20-35 mm)	disc

Code	Product	Unit
ECRM-D 289-1	Heat-resisting steel - chips Year of issue: 1990 Certified values C ..... 0.0489 ± 0.0022 % Si ..... 0.531 ± 0.013 % Mn ..... 1.016 ± 0.016 % P ..... 0.0114 ± 0.0010 % S ..... 0.0027 ± 0.0004 % Cr ..... 14.63 ± 0.11 % Mo ..... 1.102 ± 0.015 % Ni ..... 24.68 ± 0.19 % Al ..... 0.199 ± 0.011 % As ..... (0.0056) % B ..... 0.0044 ± 0.0004 % Co ..... 0.065 ± 0.006 % Pb ..... (0.0008) % Sn ..... 0.111 ± 0.010 % Ti ..... 2.01 ± 0.05 % V ..... 0.260 ± 0.015 % Sb ..... (0.0013) % (Values in parenthesis are indicative values)	100 g
ECRM-D 289-1-D	Heat-resisting steel - disc (35-39 mm x 20-35 mm)	disc
ECRM-D 290-1	High-speed steel, 4% chromium, 5% cobalt und 5% molybdenum, no. 1.3243 - powder Year of issue: 1990 Certified values C ..... 0.911 ± 0.010 % Si ..... 0.072 ± 0.007 % Mn ..... 0.244 ± 0.010 % P ..... 0.0160 ± 0.0005 % S ..... 0.0160 ± 0.0008 % Cr ..... 4.18 ± 0.06 % Mo ..... 4.83 ± 0.09 % Ni ..... 0.329 ± 0.018 % Co ..... 5.12 ± 0.12 % Cu ..... 0.081 ± 0.004 % N ..... 0.0325 ± 0.0012 % V ..... 1.91 ± 0.04 % W ..... 6.27 ± 0.14 %	100 g
ECRM-D 290-1-D	High-speed steel, 4% chromium, 5% cobalt und 5% molybdenum, no. 1.3243 - disc (35-39 mm x 20-35 mm)	disc
ECRM-D 291-1	Highly alloyed steel, 17% chromium and 2% molybdenum, no. 1.4748 - powder Year of issue: 1990 Certified values C ..... 0.903 ± 0.008 % Si ..... 0.907 ± 0.018 % Mn ..... 0.808 ± 0.011 % P ..... 0.0168 ± 0.0016 % S ..... 0.0087 ± 0.0007 % Cr ..... 17.10 ± 0.10 % Mo ..... 2.10 ± 0.06 % Ni ..... 0.563 ± 0.011 % Al ..... 0.0030 ± 0.0006 % Co ..... 0.0233 ± 0.0022 % Cu ..... 0.0711 ± 0.0019 % N ..... 0.1142 ± 0.0038 % Nb ..... (0.0057) % V ..... 0.388 ± 0.016 % (Values in parenthesis are indicative values)	100 g
ECRM-D 291-1-D	Highly alloyed steel, 17% chromium and 2% molybdenum, no. 1.4748 - disc (35-39 mm x 20-35 mm)	disc
ECRM-D 294-1	Manganese steel, material-no. 1.3816 - chips Year of issue: 2005 Certified values C ..... 0.0657 ± 0.0010 %* Si ..... 0.283 ± 0.005 %* Mn ..... 18.68 ± 0.04 %* P ..... 0.0273 ± 0.0013 %* S ..... 0.00031 ± 0.00009 %* Cr ..... 17.98 ± 0.05 %* Mo ..... 0.0861 ± 0.0022 %* Ni ..... 0.427 ± 0.006 %* Al ..... (0.0095) % As ..... 0.00365 ± 0.00029 %* B ..... (<0.00005) % Co ..... 0.0288 ± 0.0009 % Cu ..... 0.0242 ± 0.0007 %* N ..... 0.566 ± 0.011 %* Nb ..... (0.00117) % Pb ..... (0.000128) % Sn ..... (0.0014) % Ti ..... (0.0008) % V ..... 0.0694 ± 0.0021 %* W ..... (0.00114) % Zr ..... (0.0001) % Ca ..... (0.00026) % Sb ..... (0.00053) % Te ..... (<0.00008) % (Values in parenthesis are indicative values) * 95%-confidence interval	100 g
ECRM-D 294-1-D	Manganese steel, material-no. 1.3816 - disc (40 mm x 20 mm)	disc
ECRM-D 297-1	1.2 % boron steel, material-no. 1.4696 - chips Year of issue: 2005 Certified values C ..... 0.0223 ± 0.0004 %* Si ..... 0.344 ± 0.006 %* Mn ..... 0.897 ± 0.007 %* P ..... 0.0135 ± 0.0004 %* S ..... 0.0101 ± 0.0003 %* Cr ..... 18.37 ± 0.03 %* Mo ..... 0.290 ± 0.005 %* Ni ..... 12.33 ± 0.02 %* Al ..... 0.0195 ± 0.0009 %* As ..... 0.0040 ± 0.0005 %* B ..... 1.1462) ± 0.009 %* Co ..... 0.0413 ± 0.0007 %* Cu ..... 0.204 ± 0.004 %* N ..... 0.0152 ± 0.0007 %* Nb ..... (0.0089) % Ti ..... 0.0072 ± 0.0004 %* V ..... 0.0535 ± 0.0008 %* W ..... (0.0057) % Zr ..... (0.0002) % Ca ..... (0.0002) % (Values in parenthesis are indicative values) * 95%-confidence interval	100 g
ECRM-D 297-1-D	1.2 % boron steel, material-no. 1.4696 - disc (40 mm x 25 mm)	disc
ECRM-B 251-1	High-speed steel, 5,4% chromium, 5.7% cobalt, 0.5% molybdenum, 1,6% vanadium und 20% tungsten - chips Year of issue: 1968 Certified values C ..... 0.84 % Si ..... 0.21 % Mn ..... 0.27 % P ..... 0.024 % S ..... 0.025 % Cr ..... 5.35 % Mo ..... 0.53 % Ni ..... 0.15 % Co ..... 5.70 % Cu ..... 0.08 % Sn ..... 0.025 % V ..... 1.59 % W 19.9	100 g

Code	Product	Unit
ECRM-B 253-1	13% Manganese steel - chips Year of issue: 1973 Certified values C 1.15 % · S 0.019 % · Co (0.35) % Si 0.34 % · Cr 0.16 % · Cu (0.177) % Mn 12.5 % · Mo (0.031) % · V (0.02) % P 0.042 % · Ni 0.29 % (Values in parenthesis are indicative values)	100 g
ECRM-B 254-1	High-speed steel, 5,1% chromium, 4,9% molybdenum, 1,9% vanadium and 7% tungsten - chips Year of issue: 1971 Certified values C 0.88 % · Cr 5.12 % · Sn 0.019 % Si 0.19 % · Mo 4.92 % · V 1.94 % Mn 0.30 % · Ni 0.12 % · W 6.97 % P 0.023 % · Co 0.32 % S 0.029 % · Cu 0.09 %	100 g
ECRM-B 254-1-D	High-speed steel, 5,1% chromium, 4,9% molybdenum, 1,9% Vanadium and 7% tungsten	disc
ECRM-B 272-1	12% Chromium steel - chips Year of issue: 2005 Certified values C 0.2815 ± 0.0012 %* · Ni 0.244 ± 0.003 %* · Nb 0.0028 ± 0.0002 %* Si 0.420 ± 0.004 %* · Al 0.0046 ± 0.0005 %* · Ti 0.00096 ± 0.00009 %* Mn 0.600 ± 0.004 %* · As 0.0116 ± 0.0005 %* · V 0.0167 ± 0.0005 %* P 0.0156 ± 0.0005 %* · B 0.0018 ± 0.0002 %* · Ca 0.00090 ± 0.00011 %* S 0.0196 ± 0.0004 %* · Co 0.0145 ± 0.0003 %* · Sb 0.00070 ± 0.00006 %* Cr 11.927 ± 0.022 %* · Cu 0.0192 ± 0.0004 %* · Zn 0.0031 ± 0.0003 %* Mo 0.0030 ± 0.0002 %* · N 0.0508 ± 0.0004 %* * 95%-confidence interval	100 g
ECRM-B 272-1-D	12% Chromium steel - disc (35-39 mm x 20-35 mm)	disc
ECRM-B 276-2	5% Cr-Mo-V steel - chips Year of issue: 1993 Certified values C 0.399 ± 0.002 %* · S 0.0189 ± 0.0003 %* · Cu 0.183 ± 0.002 %* Si 1.034 ± 0.004 %* · Cr 4.975 ± 0.012 %* · N 0.0116 ± 0.0001 %* Mn 0.365 ± 0.002 %* · Mo 1.134 ± 0.010 %* · Sn 0.0133 ± 0.0002 %* P 0.0093 ± 0.0003 %* · Ni 0.203 ± 0.002 %* · V 0.296 ± 0.005 %* * 95%-confidence interval	100 g
ECRM-B 276-2-D	5% Cr-Mo-V steel	disc
ECRM-B 281-1	Stainless steel, 18% chromium and 9% nickel - chips Year of issue: 1980 Certified values C 0.048 ± 0.002 % · Cr 18.17 ± 0.05 % · Cu 0.076 ± 0.003 % Si 0.929 ± 0.008 % · Ni 9.37 ± 0.05 % · N 0.023 ± 0.001 % Mn 0.786 ± 0.007 % · Al 0.015 ± 0.001 % · Pb (0.0005) % P 0.012 ± 0.001 % · B (0.0012) % · Sn 0.009 ± 0.001 % S 0.016 ± 0.001 % · Co 0.023 ± 0.002 % · Ti 0.216 ± 0.007 % (Values in parenthesis are indicative values)	100 g
ECRM-B 285-2	Maraging steel - chips Year of issue: 1997 Certified values C 0.0018 ± 0.0002 %* · Cr 0.0236 ± 0.0011 %* · Co 7.76 ± 0.04 %* Si 0.0117 ± 0.0008 %* · Mo 4.99 ± 0.02 %* · Cu 0.0094 ± 0.0004 %* Mn 0.0168 ± 0.0004 %* · Ni 18.07 ± 0.04 %* · N 0.0007 ± 0.0001 %* P 0.0053 ± 0.0005 %* · Al 0.1067 ± 0.0018 %* · Ti 0.520 ± 0.004 %* S 0.0025 ± 0.0002 %* · B 0.0009 ± 0.0001 %* · Zr 0.0050 ± 0.0001 %* * 95%-confidence interval	100 g
ECRM-B 285-2-D	Maraging steel - disc (35-39 mm x 20-35 mm)	disc
ECRM-B 287-1	High boron stainless steel - chips Year of issue: 1986 Certified values C 0.016 ± 0.0005 %* · S 0.0014 ± 0.0002 %* · B 0.924R ± 0.003 %* Si 0.569 ± 0.009 %* · Cr 18.61 ± 0.04 %* · Co 0.148 ± 0.002 %* Mn 1.478 ± 0.009 %* · Mo 0.247 ± 0.004 %* · Cu 0.203 ± 0.002 %* P 0.0267 ± 0.0006 %* · Ni 10.35 ± 0.04 %* · N 0.0194 ± 0.0005 %* * 95%-confidence interval	100 g
ECRM-B 287-1-D	High boron stainless steel - disc (35-39 mm x 20-35 mm)	disc

Code	Product	Unit
ECRM-B 292-1	Nb-stabilised stainless steel - chips Year of issue: 1990 Certified values C ..... 0.0367 ± 0.0008 %* Si..... 0.402 ± 0.005 %* Mn ..... 1.744 ± 0.006 %* P..... 0.0175 ± 0.0007 %* S..... 0.0055 ± 0.0002 %* Cr ..... 18.00 ± 0.02 %* Mo.....0.0464 ± 0.0011 %* Ni .....10.09 ± 0.02 %* Al .....(0.002) % As .....(0.008) % B .....(0.0003) % Co.....0.0255 ± 0.0011 %* Cu ..... 0.0391 ± 0.0010 %* N ..... 0.0640 ± 0.0012 %* Nb ..... 0.571 ± 0.012 %* Ca ..... (0.0006) % Ta..... (0.001) % (Values in parenthesis are indicative values) * 95%-confidence interval	100 g
ECRM-B 292-1-D	Nb-stabilised stainless steel - disc (35-39 mm x 20-35 mm)	disc
ECRM-B 295-1	4% Mo-Cr-Ni steel - chips Year of issue: 1995 Certified values C ..... 0.0166 ± 0.0004 %* Si..... 0.418 ± 0.008 %* Mn ..... 1.758 ± 0.009 %* P..... 0.0167 ± 0.0005 %* S..... 0.0003 ± 0.0001 %* Cr ..... 19.51 ± 0.06 %* Mo.....3.996 ± 0.024 %* Ni .....24.40 ± 0.04 %* Al .....0.0203 ± 0.0005 %* As .....0.0041 ± 0.0002 %* B .....0.0018 ± 0.0001 %* Co.....0.0450 ± 0.0011 %* Cu ..... 1.481 ± 0.012 %* N ..... 0.0615 ± 0.0008 %* Sn..... 0.0025 ± 0.0003 %* V..... 0.0456 ± 0.0015 %* Fe..... 48.36 ± 0.11 %* Sb..... 0.0007 ± 0.0001 %* * 95%-confidence interval	100 g
ECRM-B 295-1-D	4% Mo-Cr-Ni steel - disc (35-39 mm x 20-35 mm)	disc
ECRM-B 296-1	Jethete steel - chips Year of issue: 1997 Certified values C ..... 0.1166 ± 0.0008 %* Si..... 0.242 ± 0.003 %* Mn ..... 0.676 ± 0.005 %* P..... 0.0178 ± 0.0004 %* S..... 0.0026 ± 0.0001 %* Cr ..... 11.82 ± 0.04 %* Mo.....1.700 ± 0.009 %* Ni .....2.790 ± 0.008 %* Al .....0.0276 ± 0.0009 %* As .....0.0139 ± 0.0006 %* B .....(0.0003) % Co.....0.0218 ± 0.0006 %* Cu ..... 0.1498 ± 0.0013 %* N ..... 0.0214 ± 0.0005 %* Pb..... 0.00016 ± 0.00004 %* Sn..... 0.0131 ± 0.0003 %* V..... 0.363 ± 0.005 %* Mg ..... (0.0003) % * 95%-confidence interval	100 g
ECRM-B 296-1-D	Jethete steel - disc (35-39 mm x 20-35 mm)	disc
ECRM-F 201-1	Stainless steel, 12% chromium - chips Year of issue: 1960 Certified values C .....0.291 % Si.....0.843 % Mn .....0.363 % Cr .....12.33 % Mo .....0.050 % Ni ..... 0.202 % Cu ..... 0.099 % Sn ..... 0.0193 % V .....(0.020) % Ca..... 0.0018 % Mg ..... (0.0005) % Sb..... (0.0033) % Zn.....0.0005 % (Values in parenthesis are indicative values)	100 g
ECRM-F 210-1	Stainless steel, 4% chromium, 8.2% molybdenum, 1.7% vanadium and 1.5% tungsten - chips Year of issue: 1967 Certified values C .....0.762 % Si.....0.200 % Mn .....0.250 % P..... (0.028) % S .....(0.022) % Cr..... 3.92 % Mo..... 8.15 % Co..... 0.185 % V.....1.65 % W .....1.54 % (Values in parenthesis are indicative values)	100 g
ECRM-F 279-2	Stainless steel, 15.6% chromium and 11% nickel - chips Year of issue: 1972 Certified values C .....0.0885 ± 0.0010 % Si.....0.5160 ± 0.0047 % Mn .....0.2584 ± 0.0045 % Cr..... 15.642 ± 0.030 % Ni ..... 1.603 ± 0.014 % Cu ..... 0.1067 ± 0.0022 %	100 g
ECRM-F 282-1	Stainless steel, 17% chromium, 11% nickel, 2% molybdenum and 0.5% titanium - chips Year of issue: 1986 Certified values C .....0.086 ± 0.003 % Si.....0.734 ± 0.016 % Mn .....1.64 ± 0.02 % P.....0.019 ± 0.002 % S ..... 0.0042 ± 0.0005 % Cr..... 16.72 ± 0.04 % Mo..... 2.19 ± 0.03 % Ni ..... 10.86 ± 0.09 % Cu .....0.109 ± 0.003 % Ti .....0.488 ± 0.007 %	100 g

Code	Product	Unit
ECRM-F 273-1	Stainless steel Z5CNU15.05 with 14.7 % Cr, 4.8 % Ni and 3 % Cu - chips	100 g

Year of issue: 2005

Certified values

C .....0.0336 ± 0.0005 %*	Mo .....0.246 ± 0.003 %*	N .....0.0444 ± 0.0004 %*
Si.....0.378 ± 0.004 %*	Ni .....4.852 ± 0.020 %*	Nb .....0.221 ± 0.004 %*
Mn.....0.785 ± 0.004 %*	Al .....(0.0062) %	Sn .....0.0021 ± 0.0001 %*
P .....0.0131 ± 0.0006 %*	As .....0.0030 ± 0.0002 %*	V .....0.0512 ± 0.0008 %*
S .....0.00037 ± 0.00006 %*	Co.....0.0391 ± 0.0005 %*	Ga .....(0.0023) %
Cr .....14.747 ± 0.014 %*	Cu.....3.047 ± 0.015 %*	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-F-273-1-D	Stainless steel Z5CNU15.05 with 14.7 % Cr, 4.8 % Ni and 3 % Cu - disc (40 mm x 20 mm)	disc
ECRM-S 274-1	Vanadium steel - chips	100 g

Year of issue: 2004

Certified values

C .....1.563 ± 0.006 %*	Ni .....0.077 ± 0.002 %*	Pb .....(0.0064) %
Si.....1.057 ± 0.008 %*	Al .....(0.0025) %	Sn .....(0.010) %
Mn.....0.397 ± 0.004 %*	As .....(0.0013) %	Ti.....(0.0011) %
P .....0.0148 ± 0.0005 %*	B .....(0.0005) %	V .....4.010 ± 0.018 %*
S .....0.0096 ± 0.0004 %*	Co.....(0.0229) %	W .....0.0087 ± 0.0007 %*
Cr .....8.036 ± 0.022 %*	Cu.....0.0281 ± 0.0005 %*	O .....0.0026 ± 0.0002+1) %
Mo .....1.455 ± 0.016 %*	N.....0.0769 ± 0.0010 %*	Sb .....(0.00019) %

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-S 274-1-D	Vanadium steel - disc (38 mm x 25 mm)	disc
ECRM-S 298-1	Duplex stainless steel (similar to EN 1.4410) - chips	100 g

Year of issue: 2002

Certified values

C .....0.0146 ± 0.0003 %*	As .....(0.0034) %	V .....0.0607 ± 0.0011 %*
Si.....0.262 ± 0.005 %*	B .....0.0021 ± 0.0001 %*	W .....(0.0180) %
Mn.....0.398 ± 0.005 %*	Co.....0.055 ± 0.001 %*	Ca .....(0.0020) %
P .....0.0197 ± 0.0004 %*	Cu.....0.201 ± 0.003 %*	Fe.....63.38 ± 0.11 %*
S .....0.0006 ± 0.0001 %*	N.....0.263 ± 0.0005 %*	Mg .....(0.0008) %
Cr .....24.72 ± 0.04 %*	Nb.....(0.0037) %	O .....(0.0036) %
Mo .....3.799 ± 0.026 %*	Pb .....0.00008 ± 0.00002 %*	Sb .....(0.00072) %
Ni .....7.056 ± 0.018 %*	Sn .....(0.0044) %	Ta.....(0.00002) %
Al.....0.0285 ± 0.0011 %*	Ti .....0.0014 ± 0.0002 %*	Zn.....(0.0010) %

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-S 298-1-D	Duplex stainless steel (similar to EN 1.4410) - disc (38 mm x 25 mm)	disc

Pure iron

ECRM-D 098-1	Pure iron - chips	100 g

Year of issue: 1993

Certified values

C .....5.1 ± 1.3 µg/g*	P ..... (0.6) µg/g	Mo .....8.5 ± 0.8 µg/g*
Si.....4.8 ± 1.1 µg/g*	S ..... 3.1 ± 0.5 µg/g*	N .....2.4 ± 0.7 µg/g*
Mn.....0.8 ± 0.4 µg/g*	Cr..... 57.1 ± 2.4 µg/g*	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-B 088-2	Pure iron - powder	100 g

Year of issue: 2001

Certified values

C .....6 ± 2 µg/g*	S ..... 70 ± 4 µg/g*	Cu .....163 ± 3 µg/g*
Si.....52 ± 5 µg/g*	Cr..... 244 ± 8 µg/g*	V .....2.9 ± 0.5 µg/g*
Mn.....809 ± 17 µg/g*	Ni ..... 275 ± 7 µg/g*	Ca .....7.2 ± 0.8 µg/g*
P .....48 ± 2 µg/g*	Co..... 61 ± 2 µg/g*	

* 95%-confidence interval

ECRM-B 097-1	Pure iron - chips	100 g

Year of issue: 1984

Certified values

C ..... 2.5 ± 0.7 µg/g	S .....22 ± 2 µg/g	B ..... 3 ± 1 µg/g
Si.....(<100) µg/g	Cr.....16 ± 5 µg/g	Co ..... 37 ± 4 µg/g
Mn..... 64 ± 4 µg/g	Ni .....25 ± 3 µg/g	Cu ..... 20 ± 2 µg/g
P .....16**R** ± 3 µg/g	As .....51 ± 5 µg/g	N ..... 7 ± 1 µg/g

(Values in parenthesis are indicative values)

R: revised value

ECRM-B 097-1-D	Pure iron - disc (35-39 mm x 20-35 mm)	disc

Code	Product	Unit

Special alloys

ECRM-D 326-1 — Nickel-base alloy with 61,2% nickel content and 16,4% chromium content - chips — 100 g

Year of issue: 1972

Certified values

C ..... 0.092 ± 0.002 %	Cr ..... 16.37 ± 0.05 %	Cu ..... (0.027) %
Si ..... 1.46 ± 0.025 %	Mo ..... (0.025) %	N ..... (0.0359) %
Mn ..... 0.406 ± 0.008 %	Ni ..... 61.16 ± 0.16 %	V ..... (0.024) %
P ..... 0.0093 ± 0.0009 %	Altotal ..... (0.79) %	Zr ..... 0.129 ± 0.008 %
S ..... 0.0028 ± 0.0006 %	Co ..... 0.223 ± 0.011 %	

(Values in parenthesis are indicative values)

ECRM-D 327-2 — High-temperature steel with 24,4% chromium, 19,7% nickel, 2% silicon and 0,15% carbon - chips — 100 g

Year of issue: 1972

Certified values

C ..... 0.152 ± 0.003 %	Cr ..... 24.35 ± 0.08 %	Cu ..... 0.060 ± 0.003 %
Si ..... 2.052 ± 0.028 %	Mo ..... 0.174 ± 0.009 %	N ..... 0.059 ± 0.0024 %
Mn ..... 1.289 ± 0.018 %	Ni ..... 19.72 ± 0.08 %	V ..... 0.044 ± 0.004 %
P ..... 0.0228 ± 0.0014 %	Al_{total} ..... 0.070 ± 0.006 %	
S ..... 0.0046 ± 0.0012 %	Co ..... 0.159 ± 0.010 %	

(Values in parenthesis are indicative values)

ECRM-D 328-1 — High-temperature turbine steel with 20,5% chromium, 20,4% nickel and 41,7% cobalt - chips — 100 g

Year of issue: 1973

Certified values

C ..... 0.390 ± 0.005 %	Mo ..... 4.41 ± 0.07 %	Nb ..... 3.61 ± 0.22 %
Si ..... 0.629 ± 0.014 %	Ni ..... 20.38 ± 0.19 %	W ..... 4.16 ± 0.04 %
Mn ..... 1.395 ± 0.012 %	Al_{total} ..... 0.070 ± 0.006 %	Fe ..... 2.40 ± 0.06 %
P ..... 0.005 ± 0.001 %	Co ..... 41.65 ± 0.24 %	Ta ..... 0.18 ± 0.02 %
S ..... 0.003 ± 0.001 %	Cu ..... 0.013 ± 0.003 %	
Cr ..... 20.54 ± 0.07 %	N ..... 0.027 ± 0.002 %	

ECRM-B 376-1 — 24% Co magnet alloy — 100 g

Year of issue: 1980

Certified values

C ..... 0.026 ± 0.002 %*	Ni ..... 13.37 ± 0.08 %*	Nb ..... 0.309 ± 0.012 %*
Si ..... 0.313 ± 0.009 %*	Al ..... 8.12 ± 0.10 %*	Ti ..... 0.158**R**± 0.003 %*
Mn ..... 0.046 ± 0.004 %*	Co ..... 23.70 ± 0.19 %*	Ta ..... (0.0155) %
S ..... 0.004 ± 0.001 %*	Cu ..... 2.94 ± 0.04 %*	

(Values in parenthesis are indicative values)

R: revised value
* 95%-confidence interval

ECRM-F 377-1 — Nickel alloy IN 625 - disc (40 mm x 20 mm) — disc

Year of issue: 1995

Certified values

C ..... 0.0202 ± 0.0007 %*	Cr ..... 21.72 ± 0.06 %*	Co ..... 0.0348 ± 0.0009 %*
Si ..... 0.077 ± 0.005 %*	Mo ..... 8.94 ± 0.05 %*	Cu ..... 0.0110 ± 0.0003 %*
Mn ..... 0.0225 ± 0.0007 %*	Ni ..... 61.45 ± 0.08 %*	Nb ..... 3.50 ± 0.04 %*
P ..... 0.0036 ± 0.0004 %*	Al ..... 0.216 ± 0.007 %*	Ti ..... 0.255 ± 0.008 %*
S ..... 0.0006 ± 0.0001 %*	B ..... (0.0006) %	Fe ..... 3.77 ± 0.06 %*

* 95%-confidence interval

ECRM-F 377-2 — Nickel alloy IN 625 - disc (40 mm x 20 mm) — disc

Year of issue: 1995

Certified values

C ..... 0.0202 ± 0.0007 %*	Cr ..... 21.72 ± 0.06 %*	Co ..... 0.0348 ± 0.0009 %*
Si ..... 0.077 ± 0.005 %*	Mo ..... 8.94 ± 0.05 %*	Cu ..... 0.0104 ± 0.0003%*
Mn ..... 0.0225 ± 0.0007 %*	Ni ..... 61.45 ± 0.08 %*	Nb ..... 3.50 ± 0.04 %*
P ..... 0.0036 ± 0.0004 %*	Al ..... 0.232 ± 0.007%*	Ti ..... 0.264 ± 0.008 %*
S ..... 0.0006 ± 0.0001 %*	B ..... (0.0006) %	Fe ..... 3.77 ± 0.06 %*

* 95%-confidence interval

ECRM-F 378-1 — Cobalt alloy, stellite grade 6 - powder — 100 g

Year of issue: 1995

Certified values

C ..... 1.181 ± 0.009 %*	S ..... 0.0055 ± 0.0006 %*	Co ..... 63.52 ± 0.19 %*
Si ..... 1.172 ± 0.022 %*	Cr ..... 28.22 ± 0.14 %*	W ..... 4.43 ± 0.05 %*
Mn ..... 0.0579 ± 0.0015 %*	Mo ..... 0.0503 ± 0.0011 %*	Fe ..... 0.606 ± 0.011 %*
P ..... (0.0023) %	Ni ..... 0.617 ± 0.011 %*	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-F 378-1-D — Cobalt alloy, stellite grade 6 - disc (40 mm x 20 mm) — disc

Code	Product	Unit

Cast irons

ECRM-D 428-2 — Cast iron GG 25, powdered material produced by atomization of the melt - powder — 100 g

Year of issue: 1998

Certified values

C^{total} ..... 2.747 ± 0.009 %*	S ..... 0.1105 ± 0.0018 %*	As ..... 0.0156 ± 0.0005 %*
Si ..... 1.752 ± 0.007 %*	Cr ..... 0.0366 ± 0.0017 %*	Cu ..... 0.0996 ± 0.0014 %*
Mn ..... 0.750 ± 0.05 %*	Mo ..... (0.0014) %	Ti ..... 0.0311 ± 0.0005 %*
P ..... 0.0691 ± 0.0011 %*	Ni ..... 0.0358 ± 0.0005 %*	V ..... 0.0120 ± 0.0003 %*

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-D 476-3 — Pig iron - powder — 100 g

Year of issue: 1996

Certified values

C_{total} ..... 3.390 ± 0.011* %	S ..... 0.0493 ± 0.0009* %	Cu ..... 0.2445 ± 0.0025* %
Si ..... 1.813 ± 0.005* %	Cr ..... 0.0648 ± 0.0012* %	N ..... 0.0038 ± 0.0001* %
Mn ..... 0.987 ± 0.008* %	Ni ..... 0.0549 ± 0.0014* %	Ti ..... 0.0222 ± 0.0005* %
P ..... 0.0908 ± 0.0023* %	As ..... 0.0145 ± 0.0007* %	V ..... 0.0115 ± 0.0002* %

* 95%-confidence interval

ECRM-D 478-2 — Hematite pig iron - powder — 100 g

Year of issue: 1996

Certified values

C_{total} ..... 4.003 ± 0.013* %	Cr ..... 0.251 ± 0.005* %	N ..... 0.0023 ± 0.0002* %
Si ..... 2.411 ± 0.021* %	Ni ..... 0.151 ± 0.007* %	Ti ..... 0.0328 ± 0.0007* %
Mn ..... 0.321 ± 0.005* %	As ..... (0.0018) %	V ..... 0.0113 ± 0.0003* %
P ..... 0.201 ± 0.006* %	B ..... 0.0006 ± 0.0001* %	
S ..... 0.0460 ± 0.0015* %	Cu ..... 0.1276 ± 0.0019* %	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-D 479-1 — Alloyed cast iron - powder — 100 g

Year of issue: 1978

Certified values

C_{total} ..... 2.86 ± 0.04 %	P ..... 0.076 ± 0.003 %	Mo ..... 0.196 ± 0.005 %
Si ..... 2.02 ± 0.02 %	S ..... 0.089 ± 0.003 %	Ni ..... 1.012 ± 0.015 %
Mn ..... 0.136 ± 0.008 %	Cr ..... 1.00 ± 0.02 %	Al ..... 0.014 ± 0.002 %

(Values in parenthesis are indicative values)

ECRM-D 480-1 — Nodular iron - powder — 100 g

Year of issue: 1979

Certified values

C_{total} ..... 3.03 ± 0.02 %	S ..... 0.0086 ± 0.0010 %	Cu ..... (0.0052) %
Si ..... 2.41 ± 0.02 %	Cr ..... (0.0164) %	Mg ..... 0.017 ± 0.001 %
Mn ..... 0.151 ± 0.005 %	Ni ..... 0.483 ± 0.007 %	
P ..... 0.0021**R** ± 0.0005 %	Al ..... 0.016 ± 0.001 %	

(Values in parenthesis are indicative values)

R: revised value

ECRM-B 451-2 — Austenitic cast iron - chips — 100 g

Year of issue: 1999

Certified values

C^{total} ..... 2.059 ± 0.007 %*	P ..... 0.0593 ± 0.0011 %*	Ni ..... 14.01 ± 0.04 %*
Si ..... 2.092 ± 0.007 %*	S ..... 0.0315 ± 0.0008 %*	Cu ..... 6.26 ± 0.02 %*
Mn ..... 1.079 ± 0.08 %*	Cr ..... 1.097 ± 0.010 %*	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-B 453-1 — High Si and P iron - chips — 100 g

Year of issue: 1972

Certified values

C_{total} ..... (2.44) %	S ..... 0.049 %	Cu ..... 0.10 %
Si ..... 3.17 %	Cr ..... 0.053 %	Ti ..... (0.040) %
Mn ..... 0.72 %	Ni ..... 0.068 %	V ..... 0.050 %
P ..... 1.63 %	As ..... 0.019 %	

(Values in parenthesis are indicative values)

ECRM-B 454-1 — Hematite pig iron - chips — 100 g

Certified values

Year of issue: 1968

C_{total} ..... (2.53) %	P ..... 0.046 %	As ..... (0.025) %
Si ..... 2.00 %	S ..... 0.068 %	Cu ..... (0.07) %
Mn ..... 1.16 %	Ni ..... (0.21) %	Ti ..... 0.052 %

(Values in parenthesis are indicative values)

Code	Product	Unit
ECRM-B 481-1	Nodular iron - chips	100 g

Year of issue: 1976

Certified values

C_{total} ..... 3.91 ± 0.02 %	S ..... 0.004 ± 0.001 %	Al ..... 0.023 ± 0.002 %
Si ..... 2.29 ± 0.02 %	Cr ..... 0.063 ± 0.006 %	As ..... 0.010 ± 0.002 %
Mn ..... 0.448 ± 0.014 %	Mo ..... 0.011 ± 0.001 %	Cu ..... 0.150 ± 0.004 %
P ..... 0.019 ± 0.001 %	Ni ..... 1.19 ± 0.02 %	Mg ..... 0.051 ± 0.002 %

Code	Product	Unit
ECRM-B 482-2	Low alloyed cast iron - chips	100 g

Year of issue: 1994

Certified values

C_{total} ..... 2.599 ± 0.012 %*	P ..... 0.0974±0.0015 %*	Mo ..... 0.454 ± 0.004 %*
Si ..... 1.815 ± 0.007 %*	S ..... 0.0491±0.0015 %*	Ni ..... 2.284 ± 0.009 %*
Mn ..... 0.728 ± 0.005 %*	Cr ..... 0.675 ± 0.006 %*	Cu ..... 1.231 ± 0.008 %*

* 95%-confidence interval

Code	Product	Unit
ECRM-B 483-1	High duty iron - chips	100 g

Year of issue: 1980

Certified values

C_{total} ..... 2.46 ± 0.02 %	Mn ..... 0.596 ± 0.011 %	Cr ..... 0.039 ± 0.004 %
Graphit ..... (1.65) %	P ..... 0.615 ± 0.018 %	Sn ..... 0.130 ± 0.003 %
Si ..... 1.75 ± 0.02 %	S ..... 0.103 ± 0.003 %	

(Values in parenthesis are indicative values)

Code	Product	Unit
ECRM-B 484-1	Whiteheart malleable iron - chips	100 g

Year of issue: 1980

Certified values

C_{total} ..... 3.20 ± 0.03 %	Mn ..... 0.395 ± 0.005 %	S ..... 0.230 ± 0.009 %
Si ..... 0.717 ± 0.016 %	P ..... 0.121 ± 0.005 %	Cr ..... 0.155 ± 0.006 %

(Values in parenthesis are indicative values)

Code	Product	Unit
ECRM-B 486-1	Foundry iron - chips	100 g

Year of issue: 1983

Certified values

C_{total} ..... 2.21 ± 0.03	S ..... 0.023 ± 0.001	Sn ..... 0.074 ± 0.006
Si ..... 2.43 ± 0.02	Cr ..... 0.104 ± 0.006	V ..... 0.020 ± 0.003
Mn ..... 0.841 ± 0.017	Ni ..... 0.057 ± 0.004	
P ..... 1.00 ± 0.04	Cu ..... 0.548 ± 0.013	

Code	Product	Unit
ECRM-B 489-1	White cast iron - chips	100 g

Year of issue: 1991

Certified values

C_{total} ..... 2.860 ± 0.013 %*	P ..... 0.815 ± 0.007 %*	N ..... (0.0056) %
Si ..... 1.524 ± 0.006 %*	S ..... 0.155 ± 0.002 %*	
Mn ..... (0.510)	Cu ..... 0.274 ± 0.003 %*	

(Values in parenthesis are indicative values)

* 95%-confidence interval

Code	Product	Unit
ECRM-F 485-2	Cast iron - chips	100 g

Year of issue: 1994

Certified values

C_{total} ..... 3.308 ± 0.015 %	P ..... 0.610 ± 0.007 %	Ni ..... 0.0742 ± 0.0010 %
Si ..... 0.508 ± 0.005 %	S ..... 0.165 ± 0.003 %	Cu ..... 0.0303 ± 0.0006 %
Mn ..... 0.190 ± 0.004 %	Cr ..... 0.0845 ± 0.0009 %	N ..... 0.0058 ± 0.0002 %

Code	Product	Unit
ECRM-F 485-3	Cast iron - chips	100 g

Year of issue: 2006

Certified values

C_{total} ..... 3.514 ± 0.009 %*	S ..... 0.1488 ± 0.0024 %*	N ..... 0.0081 ± 0.0002 %*

* 95%-confidence interval

Code	Product	Unit
ECRM-F 487-1	Cast iron - chips	100 g

Year of issue: 1986

Certified values

C_{total} ..... 3.27 ± 0.04 %	S ..... 0.0007 ± 0.0002 %	Co ..... 0.0088 ± 0.0007 %
Si ..... 0.006 ± 0.001 %	Cr ..... 0.063 ± 0.003 %	N ..... 0.0042 ± 0.0004 %
Mn ..... 0.094 ± 0.002 %	Ni ..... 0.040 ± 0.002 %	
P ..... 0.0020 ± 0.0004 %	As ..... 0.011 ± 0.001 %	

Code	Product	Unit
ECRM-F 488-2	Low alloyed white cast iron - chips Year of issue: 1998 Certified values C_{total} 3.965 ± 0.009 %* · Si 0.374 ± 0.005 %* · Mn 0.201 ± 0.002 %* · P 0.0111±0.0002 %* · S 0.1173±0.0011 %* · Cr 0.303 ± 0.004 %* · Mo (0.0008) · Ni 0.1247±0.0009 %* · Cu 0.0256±0.0004 %* · N 0.0052±0.0003 %* · Sn 0.0013±0.0001 %* · Ti 0.0636±0.0009 %* · V 0.0545±0.0005 %* · Te (0.0089) % · Zn (0.0006) % (Values in parenthesis are indicative values) * 95%-confidence interval	100 g
ECRM-F 490-1	White cast iron (Spiegel) with 4.8% C and 10.8% Mn - chips Year of issue: 2003 Certified values C_{total} 4.813 ± 0.011 %* · Si (0.029) · Mn 10.83 ± 0.05 %* · P 0.0267 ± 0.0006 %* · S 0.0040 ± 0.0004 %* · Cr 0.0183 ± 0.0010 %* · Ni (0.019) % · Cu 0.0088 ± 0.0002 %* · N 0.0030 ± 0.0002 %* · Ti 0.0035 ± 0.0003 %* · V 0.0152 ± 0.0007 %* (Values in parenthesis are indicative values) * 95%-confidence interval	100 g
ECRM-F 491-1	White cast iron, for C/S-determination - chips Year of issue: 2006 Certified values C_{total} 3.616 ± 0.018 %* · S 0.0866 ± 0.0013 %* * 95%-confidence interval	100 g

Ferro alloys

Code	Product	Unit
ECRM-D 502-2	Ferromanganese, high-carbon - powder Year of issue: 2004 Certified values C 6.94 ± 0.02 % · Si (0.092) % · Mn 77.87 ± 0.11 % · P 0.148 ± 0.004 % · S (0.0024) % · Cr 0.0265 ± 0.0006 % · Ni 0.0384 ± 0.0003 % · B (0.0006) % · Co (0.048) % · Cu 0.037 ± 0.0006 % · N (0.017) % · Ti 0.0034 ± 0.0003 % · Fe (14.6) % · Pb 0.0179 ± 0.0011 % (Values in parenthesis are indicative values)	100 g
ECRM-D 529-1	Ferro silicon, silicon content 91.1% - powder Year of issue: 1975 Certified values C 0.10 ± 0.01 % · Si 91.11 ± 0.33 % · Mn 0.04 ± 0.005 % · P 0.013 ± 0.001 % · Al 0.86 ± 0.02 % · Cu 0.01 ± 0.001 % · Ti 0.09 ± 0.004 % · Ca 0.46 ± 0.04 % · Fe 6.15 ± 0.08 % · Mg 0.04 ± 0.006 %	100 g
ECRM-D 589-1	Ferro titanium with titanium content 68.4%, vanadium content 2.3%, aluminium content 5.3% and iron content 16.9% - powder Year of issue: 1991 Certified values C 0.132 ± 0.008 % · Si (0.41) % · Mn 0.151 ± 0.005 % · P (0.0107) % · S 0.0152 ± 0.0011 % · Cr 0.506 ± 0.023 % · Mo 0.934 ± 0.017 % · Ni 0.663 ± 0.015 % · Al 5.34 ± 0.08 % · Co 0.115 ± 0.006 % · Cu 0.146 ± 0.006 % · N 0.64 ± 0.05 % · Sn 0.55 ± 0.03 % · Ti 68.4 ± 0.5 % · V 2.32 ± 0.07 % · Zr 0.866 ± 0.030 % · Fe 16.93 ± 0.17 % · Zn (0.0103) % (Values in parenthesis are indicative values)	100 g
ECRM-D 591-1	Ferro vanadium with vanadium content 79.7%, aluminium content 3.2% and iron content 14.6% - powder Year of issue: 1996 Certified values C 0.141 ± 0.004 % · Si 0.847 ± 0.012 % · Mn 0.307 ± 0.004 % · P 0.0299 ± 0.0017 % · S 0.0153 ± 0.0008 % · Ni 0.0141 ± 0.0014 % · Al 3.19 ± 0.05 % · As 0.0022 ± 0.0002 % · B (0.0018) % · Cu 0.0596 ± 0.0016 % · N (0.308) % · Ti (0.044) % · V 79.72 ± 0.14 % · Ca (0.0328) % · Fe 14.59 ± 0.10 % · Mg (0.044) % · O (0.516) % (Values in parenthesis are indicative values)	100 g

Code	Product	Unit
ECRM-B 554-1	Ferro chromium, low carbon with chromium content 74.6% - chips Year of issue: 1972 Certified values C 0.007 % · P (0.018) % · V (0.10) % Si 0.53 % · S (< 0.005) % Mn (0.09) % · Cr 74.6 % (Values in parenthesis are indicative values)	100 g
ECRM-B 555-1	Ferro tungsten, tungsten content 79.9% -powder Year of issue: 1975 Certified values C 0.025 % · S (0.018) % · W 79.9 % Si 1.75 % · Al 0.14 % P (0.02) % · Sn 0.034 % (Values in parenthesis are indicative values)	100 g
ECRM-B 576-1	Ferro niobium, niobium content 40% - powder Year of issue: 1976 Certified values C 0.201 ± 0.004 % · Nb 43.90 ± 0.22 % · Ta 0.306 ± 0.023 % Si 1.79 ± 0.07 % · Sn 0.195 ± 0.011 % Al 2.53 ± 0.05 % · Ti 1.32 ± 0.04 %	100 g
ECRM-B 577-1	Ferro vanadium with vanadium content 50.2% and aluminium content 0.4% - powder Year of issue: 1978 Certified values C 0.089 ± 0.003 % · P 0.035 ± 0.003 % · Al 0.414 ± 0.018 % Si 1.79 ± 0.03 % · S 0.034 ± 0.002 % · Cu 0.054 ± 0.003 % Mn 0.158 ± 0.007 % · Ni 0.053 ± 0.005 % · V 50.16 ± 0.13 %	100 g
ECRM-B 578-1	Ferro molybdenum, molybdenum content 72.2% - powder Year of issue: 1978 Certified values C 0.016 ± 0.002 % · P 0.024 ± 0.002 % · Mo 72.23 ± 0.16 % Si 0.208 ± 0.010 % · S 0.065 ± 0.003 % · Cu 0.136 ± 0.010 %	100 g
ECRM-B 579-1	Ferro niobium, niobium content 60% - powder Year of issue: 1981 Certified values C 0.037 ± 0.002 % · Al 1.86 ± 0.06 % · Ti 0.567 ± 0.053 % Si 1.03 ± 0.05 % · Co 0.0051 ± 0.0010 % · Ta 3.85 ± 0.15 % P 0.064 ± 0.004 % · Nb 62.87 ± 0.17 % S 0.021 ± 0.002 % · Sn 0.344 ± 0.016 %	100 g
ECRM-B 580-1	Ferro chromium, low carbon with chromium content 72,2% - chips Year of issue: 1981 Certified values C 0.019 ± 0.002 % · Cr 72.18 ± 0.11 % · V 0.083 ± 0.006 % Si 0.306 ± 0.011 % · Co 0.047 ± 0.004 % P 0.011 ± 0.001 % · N 0.035 ± 0.002 %	100 g
ECRM-B 583-1	Ferro manganese, low carbon with manganese content 86,4% - powder Year of issue: 1982 Certified values C 0.333 ± 0.008 % · Mn 86.42 ± 0.15 % · S (0.007) % Si 0.396 ± 0.012 % · P 0.146 ± 0.006 % (Values in parenthesis are indicative values)	100 g
ECRM-B 584-1	Ferro titanium with titanium content 37.2% and aluminium content 7.2% - powder Year of issue: 1983 Certified values C 0.044 ± 0.004 % · P 0.032 ± 0.003 % · Ti 37.17 ± 0.26 % Si 1.80 ± 0.07 % · S 0.030 ± 0.002 % Mn 1.13 ± 0.02 % · Al 7.19 ± 0.23 % (Values in parenthesis are indicative values)	100 g
ECRM-B 585-2	High-Carbon Ferro-Chromium - powder	100 g
ECRM-B 587-1	Ferro boron, boron content 18.7% - powder Year of issue: 1986 Certified values C 0.738 ± 0.016 % · Cr (0.104) % · Ti (0.039) % Si (0.129) % · Mo (0.005) % · V (0.004) % Mn 0.272 ± 0.008 % · Al 0.047 ± 0.003 % · Ca (0.048) % P (0.020) % · B 18.7 ± 0.3 % S (0.0010) % · Co (0.010) % (Values in parenthesis are indicative values)	100 g

Code	Product	Unit
ECRM-B 590-1	Ferro tungsten, tungsten content 79.5% - powder Year of issue: 1991 Certified values C ..... 0.025 ± 0.007 % Mo ..... 0.101 ± 0.003 % W ..... 79.5 ± 0.11 % Si..... 1.05 ± 0.03 % Cu..... 0.048 ± 0.001 % Mn..... 0.136 ± 0.004 % Sn..... 0.045 ± 0.002 %	100 g
ECRM-F 503-1	Ferro manganese, low carbon with manganese content 80.8% - powder Year of issue: 1962 Certified values C ..... 0.700 ± 0.002 % Mn ..... 80.80 ± 0.10 % S .....(0.009) % Si..... 0.865 ± 0.006 % P..... 0.069 ± 0.002 % (Values in parenthesis are indicative values)	100 g
ECRM-F 507-1	Ferro chromium, high carbon with chromium content 70.3% - powder Year of issue: 1965 Certified values C ..... 5.40 ± 0.10 % Mn ..... 0.27 ± 0.03 % Cr ..... 70.30 ± 0.10 % Si..... 1.20 ± 0.03 % P..... 0.017 ± 0.003 % N ..... 0.049 ± 0.003 %	100 g
ECRM-F 509-1	Ferro chromium, low carbon with chromium content 72.9% - chips Year of issue: 1967 Certified values C ..... 0.012 ± 0.001 % P .....(0.019) % N .....(0.032) % Si..... 0.230 ± 0.008 % Cr..... 72.85 ± 0.15 % (Values in parenthesis are indicative values)	100 g
ECRM-F 510-1	Ferro titanium with titanium content 26.9% - powder Year of issue: 1967 Certified values C ..... 0.058 ± 0.003 % P .....(0.035) % Ti..... 26.95 ± 0.05 % Si..... 4.65 ± 0.08 % Al .....(4.9) % (Values in parenthesis are indicative values)	100 g
ECRM-F 511-1	Ferro vanadium with vanadium content 80.7% - powder Year of issue: 1967 Certified values C ..... 0.049 ± 0.002 % P .....(0.016) % V ..... 80.7 ± 0.2 % Si..... 0.341 ± 0.008 % S..... 0.018 ± 0.002 % (Values in parenthesis are indicative values)	100 g
ECRM-F 582-2	Ferro silicon, silicon content 75.2% - powder Year of issue: 1990 Certified values C ..... 0.150 ± 0.013 % S .....(0.003) % Ca ..... 0.405 ± 0.012 % Si..... 75.22 ± 0.20 % Cr..... 0.074 ± 0.004 % Fe..... 21.42 ± 0.22 % Mn..... 0.230 ± 0.006 % Al ..... 1.154 ± 0.030 % P ..... 0.018 ± 0.0014 % Ti ..... 0.225 ± 0.011 % (Values in parenthesis are indicative values)	100 g
ECRM-F 586-1	Silico manganese with manganese content 62.5% and silicon content 34% - powder Year of issue: 1985 Certified values C ..... 0.025 ± 0.003 % Cr..... 0.044 ± 0.002 % Ca ..... 0.039 ± 0.003 % Si..... 34.0 ± 0.2 % Al ..... 0.022 ± 0.003 % Fe..... 2.89 ± 0.05 % Mn..... 62.5 ± 0.2 % Co..... 0.007 ± 0.001 % P ..... 0.041 ± 0.003 % V..... 0.041 ± 0.003 %	100 g

Code	Product	Unit

Ores, iron oxide

ECRM-D 627-2	Minette CaO-rich with 31.8% iron content - powder Year of issue:1966 Certified values Fe_{total} ..... 31.77 ± 0.12 % MgO..... 1.57 ± 0.08 % s ..... 0.020 ± 0.001 % SiO_2..... 9.24 ± 0.08 % Mn ..... 0.250 ± 0.012 % Cr ..... 0.018 ± 0.003 % Al_2O_3 ..... 4.49 ± 0.12 % P..... 0.661 ± 0.014 % Cu .....(0.002) % CaO ..... 15.67 ± 0.21 % S..... 0.114 ± 0.009 % TiO_2..... 0.225 ± 0.014 % (Values in parenthesis are indicative values)	100 g

Code	Product	Unit
ECRM-D 629-1	Minette CaO-rich with 36.2% iron content - powder	100 g

Year of issue:1966

Certified values

Fe_{total} ..... 36.21 ± 0.13 %	MgO ..... 1.64 ± 0.08 %	As ..... 0.023 ± 0.001 %
SiO_2 ..... 19.25 ± 0.14 %	Mn ..... 0.390 ± 0.012 %	Cr ..... 0.016 ± 0.002 %
Al_2O_3 ..... 4.07 ± 0.08 %	P ..... 0.696 ± 0.013 %	Cu ..... (0.001) %
CaO ..... 5.63 ± 0.08 %	S ..... 0.063 ± 0.006 %	TiO_2 ..... 0.216 ± 0.013 %

(Values in parenthesis are indicative values)

ECRM-D 630-1	Iron ore, Bomi hill concentrate with 65.6% iron content - powder	100 g

Year of issue:1969

Certified values

Fe_{total} ..... 65.63 ± 0.17 %	CaO ..... 0.10 ± 0.017 %	P ..... 0.043 ± 0.003 %
SiO_2 ..... 5.88 ± 0.07 %	MgO ..... 0.47 ± 0.046 %	S ..... 0.032 ± 0.004 %
Al_2O_3 ..... 0.88 ± 0.038 %	Mn ..... 0.060 ± 0.005 %	TiO_2 ..... 0.066 ± 0.013 %

ECRM-D 631-1	Venezuela iron ore with 61.1% iron content - powder	100 g

Year of issue:1961

Certified values

Fetotal ..... 61.09 ± 0.09 %	MgO ..... 0.54 ± 0.059 %	Na_2O ..... (0.04) %
SiO_2 ..... 3.20 ± 0.06 %	Mn ..... 0.044 ± 0.006 %	K_2O ..... (0.04) %
Al_2O_3 ..... 1.06 ± 0.05 %	P ..... 0.114 ± 0.005 %	TiO_2 ..... 0.109 ± 0.006 %
CaO ..... 0.75 ± 0.038 %	S ..... 0.033 ± 0.006 %	

(Values in parenthesis are indicative values)

ECRM-D 633-1	Manganese ore, Manganese Content 47.9% - powder	100 g

Year of issue:1967

Certified values

Fe_{total} ..... 1.64 ± 0.04 %	MgO ..... 0.58 ± 0.10 %	As ..... (0.0040) %
SiO_2 ..... 10.39 ± 0.15 %	Mn ..... 47.85 ± 0.21 %	BaO ..... 1.13 ± 0.08 %
Al_2O_3 ..... 1.64 ± 0.12 %	P ..... 0.170 ± 0.007 %	TiO_2 ..... 0.079 ± 0.009 %
CaO ..... 2.02 ± 0.12 %	S ..... 0.227 ± 0.009 %	

(Values in parenthesis are indicative values)

ECRM-D 678-1	Kiruna D Iron Ore with 60.8% iron content - powder	100 g

Year of issue:1975

Certified values

Fe_{total} ..... 60.75 ± 0.07 %	Mn ..... 0.08 ± 0.01 %	K ..... 0.11 ± 0.01 %
Si ..... 1.73 ± 0.04 %	P ..... 1.61 ± 0.04 %	K_2O ..... 0.13 %
Al ..... 0.28 ± 0.03 %	S ..... 0.021 ± 0.002 %	F ..... 0.29 ± 0.02 %
Ca ..... 3.92 ± 0.09 %	Na ..... 0.11 ± 0.01 %	Ti ..... 0.13 ± 0.01 %
Mg ..... 0.57 ± 0.02 %	Na_2O ..... 0.15 %	V ..... 0.12 ± 0.01 %

ECRM-D 680-1	Iron ore, purple ore with 60% iron content - powder	100 g

Year of issue:1977

Certified values

Fe_{total} ..... 59.98 ± 0.08 %	MgO ..... 0.23 ± 0.02 %	Cu ..... 0.063 ± 0.003 %
Si ..... 4.20 ± 0.02 %	Mn ..... 0.025 ± 0.002 %	Ni ..... 0.007 ± 0.001 %
SiO_2 ..... 8.98 ± 0.04 %	P ..... 0.018 ± 0.002 %	Pb ..... 0.317 ± 0.008 %
Al ..... 0.66 ± 0.02 %	S ..... 0.544 ± 0.017 %	Ti ..... 0.045 ± 0.003 %
Al_2O_3 ..... 1.23 ± 0.04 %	Na ..... 0.128 ± 0.004 %	TiO_2 ..... 0.08 ± 0.005 %
Ca ..... 0.45 ± 0.02 %	K ..... 0.078 ± 0.003 %	Zn ..... 0.165 ± 0.004 %
CaO ..... 0.63 ± 0.03 %	As ..... 0.057 ± 0.003 %	
Mg ..... 0.14 ± 0.01 %	Cr ..... 0.005 ± 0.001 %	

ECRM-D 686-1	Iron oxide recovered from pickling bath (Ruthner) - powder	100 g

Year of issue:2002

Certified values

Fe_{total} ..... 69.44 ± 0.11 %	P ..... 0.0078 ± 0.0001 %	Ti ..... 0.0014 ± 0.0001 %
Si ..... 0.0083 ± 0.0005 %	Na ..... 0.0058 ± 0.0005 %	Zn ..... 0.0004 ± 0.0001 %
Al ..... 0.0407 ± 0.0012 %	K ..... 0.0024 ± 0.0004 %	Cl ..... 0.095 ± 0.006 %
Ca ..... 0.0097 ± 0.0007 %	Cr ..... 0.0182 ± 0.0006 %	Co ..... 0.0019 ± 0.0001 %
Mg ..... 0.0027 ± 0.0002 %	Cu ..... 0.0038 ± 0.0003 %	Mo ..... 0.0007 ± 0.0001 %
Mn ..... 0.231 ± 0.004 %	Ni ..... 0.0127 ± 0.0004 %	Sn ..... 0.0025 ± 0.0002 %

ECRM-B 651-1	Lincolnshire iron ore - powder	100 g

Year of issue: 1975

Certified values

Fe_{total} ..... 23.85 %	Mg ..... 1.04 %	Na_2O ..... 0.07 %
Si ..... 3.46 %	MgO ..... 1.73 %	K ..... 0.27 %
SiO_2 ..... 7.40 %	Mn ..... 0.97 %	K_2O ..... 0.32 %
Al ..... 2.25 %	MnO ..... 1.25 %	Ti ..... 0.10 %
Al_2O_3 ..... 4.26 %	P ..... 0.35 %	TiO_2 ..... 0.16 %
Ca ..... 16.2 %	S ..... 0.40 %	
CaO ..... 22.6 %	Na ..... 0.05 %	

Code	Product	Unit

ECRM-B 676-1 — Iron ore sinter - powder — 100 g

Year of issue: 1975

Certified values

Fe_{total} 39.76 ± 0.08 %	Mg 1.16 ± 0.04 %	Na_2O 0.128 %
Si 6.40 ± 0.05 %	MgO 1.92 %	K 0.43 ± 0.02 %
SiO_2 13.69 %	Mn 0.83 ± 0.01 %	K_2O 0.52 %
Al 3.40 ± 0.07 %	P 0.59 ± 0.02 %	F 0.10 ± 0.01 %
Al_2O_3 6.42 %	P_2O_5 1.35 %	Ti 0.19 ± 0.01 %
Ca 12.78 ± 0.13 %	S 0.12 ± 0.006 %	TiO_2 0.32 %
CaO 17.88 %	Na 0.095 ± 0.004 %	V 0.070 ± 0.004 %

ECRM-B 681-1 — Iron ore - powder — 100 g

Year of issue: 1976

Certified values

Fe_{total} 33.21 ± 0.13 %	MnO 0.29 %	Cr 0.041 ± 0.002 %
Si 8.32 ± 0.08 %	P 0.88 ± 0.02 %	Cr_2O_3 0.060 %
SiO_2 17.79 %	P_2O_5 2.01 %	F 0.19 ± 0.01 %
Al 5.62 ± 0.10 %	S 0.103 ± 0.006 %	Ni 0.016 ± 0.001 %
Al_2O_3 10.61 %	Na 0.068 ± 0.008 %	Pb (0.0072) %
Ca 2.80 ± 0.10 %	Na_2O 0.092 %	Ti 0.29 ± 0.01 %
CaO 3.92 %	K 0.49 ± 0.01 %	TiO_2 0.48 %
Mg 0.89 ± 0.02 %	K_2O 0.59 %	V 0.077 ± 0.004 %
MgO 1.47 %	As (0.0109) %	V_2O_5 0.138 %
Mn 0.22 ± 0.01 %	C 1.80 ± 0.04 %	

(Values in parenthesis are indicative values)

ECRM-B 683-1 — Iron ore sinter - powder — 100 g

Year of issue: 1982

Certified values

Fe_{total} 56.06 ± 0.12 %	Mn 0.462 ± 0.007 %	Cr 0.018 ± 0.002 %
Si 3.38 ± 0.03 %	MnO 0.596 %	Cr_2O_3 0.026 %
SiO_2 7.23 %	P 0.148 ± 0.004 %	F 0.020 ± 0.002 %
Al 1.30 ± 0.05 %	P_2O_5 0.339 %	Ti 0.097 ± 0.006 %
Al_2O_3 2.46 %	S (0.013) %	TiO_2 0.162 %
Ca 5.70 ± 0.08 %	Na 0.045 ± 0.007 %	V 0.026 ± 0.004 %
CaO 7.97 %	Na_2O 0.061 %	V_2O_5 0.046 %
Mg 1.04 ± 0.02 %	K 0.148 ± 0.012 %	Zn 0.010 ± 0.001 %
MgO 1.72 %	K_2O 0.178 %	

ECRM-F 601-1 — Iron ore 36.8% iron content - powder — 100 g

Year of issue: 1968

Certified values

Fe_{total} 36.76 ± 0.17 %	Ca 4.05 ± 0.15 %	S 0.065 ± 0.008 %
Fe(II) (8.8) %	Mg 1.21 ± 0.08 %	Ti 0.114 ± 0.005 %
Si 8.95 ± 0.07 %	Mn 0.370 ± 0.013 %	
Al 2.33 ± 0.25 %	P 0.590 ± 0.016 %	

(Values in parenthesis are indicative values)

ECRM-F 603-1 — Iron ore 53.7% iron content - powder — 100 g

Year of issue: 1968

Certified values

Fe_{total} 53.65 ± 0.15 %	Ca (0.91) %	S 0.097 ± 0.006 %
Fe(II) (0.3) %	Mg (0.2) %	Ti 0.137 ± 0.008 %
Si 1.28 ± 0.03 %	Mn 0.440 ± 0.013 %	
Al 4.20 ± 0.16 %	P 0.084 ± 0.007 %	

(Values in parenthesis are indicative values)

ECRM-F 604-1 — Iron ore 65.7% iron content - powder — 100 g

Year of issue: 1968

Certified values

Fe_{total} 65.69 ± 0.17 %	Ca (0.13) %	S 0.015 ± 0.002 %
Fe(II) (0.5) %	Mg (0.06) %	Ti 0.060 ± 0.006 %
Si 1.27 ± 0.04 %	Mn 0.092 ± 0.008 %	
Al 0.93 ± 0.07 %	P 0.053 ± 0.010 %	

(Values in parenthesis are indicative values)

ECRM-F 606-1 — Iron ore 59.7% iron content - powder — 100 g

Year of issue: 1970

Certified values

Fe_{total} 59.66 ± 0.14 %	Ca 1.04 ± 0.12 %	S 0.033 ± 0.004 %
Fe(II) (0.1) %	Mg 0.32 ± 0.05 %	Ti 0.019 ± 0.004 %
Si 1.04 ± 0.03 %	Mn 2.59 ± 0.06 %	
Al 0.34 ± 0.06 %	P 0.026 ± 0.006 %	

(Values in parenthesis are indicative values)

Iron and steel products

Code	Product	Unit
ECRM-F 607-1	Iron ore 30.9% iron content Year of issue: 1970 Certified values Fe_{total} ..... 30.89 ± 0.17 % Fe(II) ..... (5.95) % Si ..... 3.07 ± 0.07 % Al ..... 2.48 ± 0.11 % Ca ..... 13.74 ± 0.17 % Mg ..... 0.77 ± 0.08 % Mn ..... 0.254 ± 0.011 % P ..... 0.529 ± 0.018 % S ..... 0.050 ± 0.007 % Ti ..... 0.123 ± 0.007 % (Values in parenthesis are indicative values)	100 g
ECRM-F 608-1	Ferriferrous marl - powder Year of issue: 1970 Certified values Fe_{total} ..... 4.00 ± 0.15 % Fe(II) ..... (1.85) % Si ..... 28.23 ± 0.27 % Al ..... 5.26 ± 0.12 % Ca ..... 6.22 ± 0.18 % Mg ..... 0.81 ± 0.09 % Mn ..... 0.044 ± 0.007 % P ..... 0.053 ± 0.006 % S ..... 0.455 ± 0.029 % Ti ..... 0.428 ± 0.018 % (Values in parenthesis are indicative values)	100 g
ECRM-F 609-1	Iron ore 30.5% iron content - powder Year of issue: 1970 Certified values Fe_{total} ..... 30.52 ± 0.16 % Fe(II) ..... (15.65) % Si ..... 7.83 ± 0.08 % Al ..... 2.26 ± 0.11 % Ca ..... 6.87 ± 0.12 % Mg ..... 2.00 ± 0.09 % Mn ..... 0.472 ± 0.031 % P ..... 0.608 ± 0.043 % S ..... 1.000 ± 0.057 % Ti ..... 0.118 ± 0.007 % (Values in parenthesis are indicative values)	100 g
ECRM-F 610-1	Laterite, 47.5% iron content - powder Year of issue: 1971 Certified values Fe_{total} ..... 47.46 ± 0.35 % Si ..... 3.16 ± 0.04 % Al ..... 1.96 ± 0.10 % Ca ..... (0.1) % Mg ..... 1.86 ± 0.11 % Mn ..... 0.581 ± 0.016 % P ..... 0.007 ± 0.002 % S ..... 0.189 ± 0.024 % Co ..... 0.075 ± 0.006 % Cr ..... 1.84 ± 0.09 % Ni ..... 1.48 ± 0.07 % Ti ..... 0.015 ± 0.005 % (Values in parenthesis are indicative values)	100 g
ECRM-F 611-1	Iron ore sinter - powder Year of issue: 1971 Certified values Fe_{total} ..... 62.22 ± 0.16 % Fe(II) ..... (13.84) % Si ..... 2.07 ± 0.04 % Al ..... 0.69 ± 0.05 % Ca ..... 2.85 ± 0.14 % Mg ..... 0.32 ± 0.04 % Mn ..... 1.97 ± 0.06 % P ..... 0.030 ± 0.008 % S ..... (0.008) % Ti ..... 0.035 ± 0.005 % (Values in parenthesis are indicative values)	100 g
ECRM-F 612-1	Iron ore sinter - powder Year of issue: 1971 Certified values Fe_{total} ..... 42.43 ± 0.13 % Fe(II) ..... (9.19) % Si ..... 5.94 ± 0.06 % Al ..... 3.00 ± 0.13 % Ca ..... 12.06 ± 0.17 % Mg ..... 1.20 ± 0.07 % Mn ..... 0.363 ± 0.014 % P ..... 0.885 ± 0.027 % S ..... 0.053 ± 0.007 % Ti ..... 0.151 ± 0.006 % (Values in parenthesis are indicative values)	100 g
ECRM-F 677-1	Iron ore 51.5% iron content - powder Year of issue: 1975 Certified values Fe_{total} ..... 51.54 ± 0.07 % Si ..... 11.78 ± 0.06 % Al ..... 0.32 ± 0.02 % Ca ..... 0.038 ± 0.006 % Mg ..... 0.012 ± 0.002 % Mn ..... 0.016 ± 0.002 % P ..... 0.017R ± 0.0007 % S ..... (0.005) % Na ..... 0.007 ± 0.002 % K ..... 0.008 ± 0.002 % Co ..... (0.0006) % Cr ..... (0.002) % Cu ..... (0.0012) % Ni ..... (0.0015) % Pb ..... (0.003) % Ti ..... 0.013 ± 0.001 % Zn ..... (0.002) % (Values in parenthesis are indicative values)	100 g

Code	Product	Unit

ECRM-F 679-1 — Iron ore 24.2% iron content - powder — 100 g

Year of issue: 1977

Certified values

Fe_{total} 24.20 ± 0.08 %	MgO 1.15 %	C 5.80 ± 0.07 %
Fe(II) (5.2) %	Mn 0.295 ± 0.005 %	Cr 0.012 ± 0.001 %
Si 3.43 ± 0.04 %	P 0.557 ± 0.009 %	Ni (0.0095) %
SiO_2 7.34 %	P_2O_5 1.275 %	Pb (0.0062) %
Al 1.99 ± 0.05 %	S 0.099 ± 0.005 %	Ti 0.106 ± 0.005 %
Al_2O_3 3.76 %	Na 0.054 ± 0.004 %	TiO_2 0.177 %
Ca 18.07 ± 0.14 %	Na_2O 0.072 %	V 0.035 ± 0.002 %
CaO 25.30 %	K 0.157 ± 0.007 %	Zn 0.021 ± 0.002 %
Mg 0.70 ± 0.02 %	K_2O 0.189 %	

(Values in parenthesis are indicative values)

ECRM-F 685-1 — Prereduced iron ore - powder — 100 g

Year of issue: 1983

Certified values

Fe_{total} 91.10 ± 0.27 %	Mg 0.239 ± 0.006 %	As (0.0017) %
Fe(II) (7.72) %	MgO 0.397 %	C 1.49 ± 0.02 %
Femet 80.80 ± 0.44 %	Mn 0.042 ± 0.003 %	Co 0.013 ± 0.001 %
Si 0.795 ± 0.052 %	P 0.017 ± 0.001 %	Cr (0.0035) %
SiO_2 1.701 %	S 0.0031 ± 0.0005 %	Cu (0.0016) %
Al 0.320 ± 0.014 %	Na 0.077 ± 0.003 %	Ni 0.018 ± 0.002 %
Al_2O_3 0.604 %	Na_2O 0.104 %	Pb (0.0020) %
Ca 0.140 ± 0.013 %	K 0.042 ± 0.004 %	Ti 0.220 ± 0.010 %
CaO 0.195 %	K_2O 0.050 %	V 0.144 ± 0.009 %

(Values in parenthesis are indicative values)

NIST-690 — Iron ore, Canada - Constituents — 100 g

Certified values

Fe_{total} 66.85 %	CaO 0.20 %	Na_2O 0.003 %
P 0.011 %	K_2O 0.0030 %	SiO_2 3.71 %
S 0.003 %	MgO 0.18 %	TiO_2 0.022 %
Al_2O_3 0.18 %	MnO 0.23 %	

NIST-691 — Iron ore, reduced - Constituents — 100 g

Certified values

C 0.12 %	S 0.005 %	Na_2O 0.186 %
Co 0.030 %	Al_2O_3 1.22 %	SiO_2 3.7 %
Cu 0.032 %	CaO 0.63 %	TiO_2 0.27 %
Fe_{total} 90.8 %	MgO 0.52 %	
P 0.006 %	MnO 0.043 %	

NIST-692 — Iron ore, Labrador - Constituents — 100 g

Certified values

Fe_{total} 59.58 %	CaO 0.023 %	Na_2O 0.008 %
P 0.039 %	K_2O 0.039 %	SiO_2 3.7 %
S 0.005 %	MgO 0.035 %	TiO_2 0.045 %
Al_2O_3 1.41 %	MnO 0.46 %	

NIST-693 — Iron ore, Nimba - Constituents — 100 g

Certified values

Fe_{total} 65.11 %	CaO 0.016 %	Na_2O 0.0028 %
P 0.056 %	K_2O 0.0028 %	SiO_2 3.87 %
S 0.005 %	MgO 0.013 %	TiO_2 0.035 %
Al_2O_3 1.02 %	MnO 0.091 %	

Ceramic materials and minerals

ECRM-D 777-1 — Silica brick - powder — 100 g

Year of issue: 1983

Certified values

Si 44.44 ± 0.15 %	MgO 0.071 ± 0.012 %	K 0.13 ± 0.02 %
SiO_2 95.06 ± 0.32 %	Al 0.42 ± 0.02 %	K_2O 0.15 ± 0.02 %
Ca 2.02 ± 0.08 %	Al_2O_3 0.80 ± 0.04 %	Na 0.02 %
CaO 2.83 ± 0.10 %	Fe 0.23 ± 0.03 %	Ti 0.27 ± 0.02 %
Mg 0.043 ± 0.007 %	Fe_2O_3 0.33 ± 0.04 %	

ECRM-D 779-1 — Magnesite - powder — 100 g

Year of issue: 1991

Certified values

Si 0.182 ± 0.015 %	B 0.0116 ± 0.0012 %	Mn 0.503 ± 0.017 %
Ca 1.691 ± 0.023 %	Cr (0.0030) %	Na (0.0058) %
Mg (54.57) %	Fe 3.73 ± 0.06 %	P 0.0267 ± 0.0026 %
Al 0.105 ± 0.007 %	K (0.0020) %	Ti 0.0081 ± 0.0012 %

(Values in parenthesis are indicative values)

Code	Product	Unit

ECRM-B 752-1 — Limestone - powder — 100 g

Year of issue: 1984

Certified values

SiO_2 0.70 %	Fe_2O_3 0.045 %	S 0.007 %
CaO 55.4 %	K_2O 0.02 %	SrO 0.019 %
MgO 0.15 %	MnO 0.010 %	TiO_2 0.009 %
Al_2O_3 0.12 %	Na_2O (0.02) %	L.O.I* 43.4 %
BaO 0.006 %	P_2O_5 (0.0055) %	

* Loss On Ignition

ECRM-B 776-1 — Firebrick - powder — 100 g

Year of issue: 1983

Certified values

Si 29.34 ± 0.18 %	BaO 0.122 ± 0.011 %	Na 0.362 ± 0.015 %
SiO_2 62.76 ± 0.39 %	Cr 0.015 ± 0.002 %	Na_2O 0.488 ± 0.020 %
Ca 0.221 ± 0.013 %	Cr_2O_3 0.022 ± 0.003 %	P 0.027 ± 0.003 %
CaO 0.310 ± 0.018 %	Fe 0.999 ± 0.017 %	P_2O_5 0.062 ± 0.007 %
Mg 0.287 ± 0.010 %	Fe_2O_3 1.43 ± 0.02 %	Ti 0.969 ± 0.015 %
MgO 0.476 ± 0.016 %	K 2.42 ± 0.05 %	TiO_2 1.62 ± 0.03 %
Al 15.50 ± 0.12 %	K_2O 2.92 ± 0.07 %	Zr (0.030) %
Al_2O_3 29.28 ± 0.22 %	Li 0.009 ± 0.001 %	L.O.I.* (0.3) %
Ba 0.109 ± 0.010 %	Li_2O 0.019 ± 0.002 %	

(Values in parenthesis are indicative values)

* Loss On Ignition

ECRM-B 781-1 — Silicon carbide refractory with 35.6% silicon and 48.3% carbon - powder — 100 g

Year of issue: 1993

Certified values

Si 35.56 ± 0.28 %	Cfrei (37.22) %	Na (0.0308) %
Ca (0.0433) %	Fe (0.806) %	Ni (0.0210) %
Mg (0.0421) %	K (0.3765) %	P (0.0117) %
Al 4.39 ± 0.04 %	Mn (0.0274) %	Ti (0.0320) %
B (0.0149) %	Mo (0.0264) %	V (0.0216) %
C 48.25 ± 0.11 %	N (0.0282) %	

(Values in parenthesis are indicative values)

ECRM-B 782-1 — Dolomite - powder — 100 g

Year of issue: 1996

Certified values

Si 0.124 ± 0.003 %*	B (0.0012) %	P 0.0056 ± 0.0003 %*
SiO_2 0.266 ± 0.007 %*	Ba (0.0007) %	P_2O_5 0.0128 ± 0.0007 %*
Ca 21.68 ± 0.05 %*	Fe 0.314 ± 0.005 %*	Pb 0.0027 ± 0.0002 %*
CaO 30.34 ± 0.07 %*	K 0.0216 ± 0.0013 %*	S (0.0159) %
Mg 12.84 ± 0.09 %*	K_2O 0.0260 ± 0.0016 %*	Ti 0.0025 ± 0.0002 %*
MgO 21.29 ± 0.15 %*	Mn 0.063 ± 0.002 %*	TiO_2 0.0042 ± 0.0004 %*
Al 0.055 ± 0.003 %*	MnO 0.081 ± 0.003 %*	Zn 0.0066 ± 0.0003 %*
Al_2O_3 0.104 ± 0.006 %*	Ni (0.0004) %	L.O.I.* 47.25 ± 0.12 %*

(Values in parenthesis are indicative values)

* 95%-confidence interval

* Loss On Ignition

ECRM-B 783-1 — Tungsten carbide - powder — 100 g

Year of issue: 2005

Certified values

C 6.188 ± 0.011+ %	Fe 0.0022 ± 0.0002+ %
C_{free} (0.042) %	O (0.016) %

(Values in parenthesis are indicative values)

ECRM-F 701-1 — Calcite - powder — 100 g

Year of issue: 1970

Certified values

Si 0.93 ± 0.03 %	Fe 0.73 ± 0.05 %	P 0.022 ± 0.004 %
Ca 37.66 ± 0.22 %	K (0.090) %	Pb (< 0.005) %
Mg 0.36 ± 0.04 %	Mn 0.022 ± 0.004 %	S 0.040 ± 0.010 %
Al 0.29 ± 0.04 %	Mo (< 0.003) %	Ti 0.018 ± 0.003 %
C (11.5) %	Na (0.020) %	Zn (< 0.005) %
Cr (< 0.002) %	Ni (0.003) %	L.O.I.* 42.4 ± 0.22 %

(Values in parenthesis are indicative values)

* Loss On Ignition

ECRM-F 702-1 — Dolomite - powder — 100 g

Year of issue: 1971

Certified values

Si 1.04 ± 0.03 %	Al 0.21 ± 0.04 %	P 0.024 ± 0.003 %
Ca 21.48 ± 0.27 %	Fe 0.440 ± 0.025 %	S 0.027 ± 0.010 %
Mg 12.37 ± 0.33 %	Mn 0.098 ± 0.006 %	Ti 0.013 ± 0.005 %

Code	Product	Unit

ECRM-F 778-1 — High carbon magnesia - powder — 100 g

Year of issue: 1986

Certified values

Si 0.489 ± 0.019 %	B_2O_3 0.0039 %	Ni (0.007) %
SiO_2 1.046 %	C 14.00 ± 0.22 %	P (0.004) %
Ca 0.883 ± 0.024 %	Cr 0.102 ± 0.004 %	Pb (< 0.001) %
CaO 1.236 %	Cr_2O_3 0.149 %	TiO_2 (0.008) %
Mg 48.87 ± 0.27 %	Fe 0.67 ± 0.05 %	Zn (< 0.002) %
MgO 81.03 %	K (0.020) %	Zr (< 0.002) %
Al 0.297 ± 0.008 %	Mn 0.011 ± 0.001 %	L.O.I.* 15.38 ± 0.14 %
Al_2O_3 0.561 %	MnO 0.014 %	
B 0.0012 ± 0.0001 %	Na (0.023) %	

(Values in parenthesis are indicative values)

* Loss On Ignition

ECRM-F 780-1 — Silicon carbide refractory with 63.5% silicon and 26.4% carbon - powder — 100 g

Year of issue: 1992

Certified values

Si 63.5 ± 0.5 %	Cr (0.010) %	Ni (0.015) %
Ca 0.84 ± 0.03 %	Fe 1.30 ± 0.06 %	O (5.24) %
Mg 0.051 ± 0.011 %	K (0.011) %	P (< 0.010) %
Al 1.86 ± 0.06 %	Mn 0.029 ± 0.004 %	Ti (0.050) %
C 26.38 ± 0.23 %	N 0.32 ± 0.05 %	V (0.025) %
Cfrei (0.563) %	Na (0.050) %	Zr (0.01) %

(Values in parenthesis are indicative values)

BCS CRM309 — Sillimanite — 100 g

Certified values

SiO_2 34.1 %	CaO 0.22 %	BaO (0.006) %
Al_2O_3 61.1 %	MgO 0.17 %	Li_2O (0.01) %
TiO_2 1.92 %	Na_2O 0.34 %	SrO (0.003) %
Fe_2O_3 1.51 %	K_2O 0.46 %	
MnO (0.03) %	L.O.I. (0.1) %	

(Values in parenthesis are indicative values)

BCS CRM313/1 — High purity silica — 100 g

Certified values

SiO_2 99.78 %	CaO 0.006 %	L.O.I. (0.1) %
Al_2O_3 0.036 %	MgO 0.0013 %	Cr_2O_3 (<0.0002) %
TiO_2 0.017 %	Na_2O 0.003 %	Li_2O (0.0005) %
Fe_2O_3 0.012 %	K_2O 0.005 %	
MnO 0.00013 %	ZrO_2 (0.002) %	

(Values in parenthesis are indicative values)

BCS CRM319/1 — Magnesite — 100 g

Certified values

SiO_2 1.093 %	CaO 3.00 %	BaO (0.0038) %
Al_2O_3 0.109 %	MgO 95.38 %	Cr_2O_3 0.0035 %
TiO_2 0.007 %	P_2O_5 (0.007) %	SrO (0.006) %
Fe_2O_3 0.291 %	ZrO_2 (0.0008) %	Y_2O_3 (0.0014) %
MnO 0.108 %	B_2O_3 (0.002) %	Ni (0.0075) %

(Values in parenthesis are indicative values)

BCS CRM348 — Ball clay — 100 g

Certified values

SiO_2 51.1 %	MgO 0.3 %	S (0.1) %
Al_2O_3 31.6 %	Na_2O 0.34 %	L.O.I. 11.8 %
TiO_2 1.08 %	K_2O 2.23 %	BaO (0.04) %
Fe_2O_3 1.04 %	P_2O_5 0.071 %	Cr_2O_3 0.016 %
CaO 0.17 %	ZrO_2 (0.03) %	C (1.64) %

(Values in parenthesis are indicative values)

BCS CRM358 — Zirconia — 100 g

Certified values

SiO_2 0.2 %	MgO 3.42 %	BaO 0.1 %
Al_2O_3 0.08 %	Na_2O (<0.01) %	HfO_2 1.63 %
TiO_2 0.2 %	K_2O (<0.01) %	SrO 0.07 %
Fe_2O_3 0.064 %	ZrO_2 92.7 %	ThO_2 (0.0007) %
CaO 1.5 %	L.O.I. 0.08 %	U_3O_8 (0.08) %

(Values in parenthesis are indicative values)

Code	Product	Unit
BCS CRM362	Mine tailings sample	100 g

Certified values

SiO_2 9.03 %	Na_2O 0.084 %	BaO (2.02) %
Al_2O_3 0.667 %	K_2O 0.14 %	Cr_2O_3 (0.003) %
TiO_2 0.047 %	PbO 2.63 %	SrO 0.034 %
Fe_2O_3 0.483 %	ZnO 2.59 %	C (9.9) %
Mn_3O_4 0.829 %	P_2O_5 (0.014) %	Cd 0.02 %
CaO 44.21 %	S 1.48 %	Ni (0.001) %
MgO 0.068 %	L.O.I. 32.81 %	

(Values in parenthesis are indicative values)

BCS CRM369	Magnesite-Chrome	100 g

Certified values

SiO_2 2.59 %	CaO 1.17 %	Cr_2O_3 17.2 %
Al_2O_3 14.7 %	MgO 53.5 %	Li_2O 0.03 %
TiO_2 0.14 %	Na_2O 0.05 %	SrO (<0.01) %
Fe_2O_3 10.3 %	K_2O 0.03 %	Ni (0.15) %
MnO 0.11 %	BaO (<0.01) %	

(Values in parenthesis are indicative values)

BCS CRM370	Magnesite-Chrome	100 g

Certified values

SiO_2 3.01 %	CaO 1.54 %	Cr_2O_3 13.4 %
Al_2O_3 12.3 %	MgO 61.8 %	Li_2O 0.03 %
TiO2 0.13 %	Na_2O 0.06 %	SrO <0.01 %
Fe_2O_3 7.23 %	K_2O 0.03 %	Ni 0.08 %
MnO 0.11 %	BaO <0,01 %	

BCS CRM375/1	Soda feldspar	100 g

Certified values

SiO_2 69.26 %	K2O 1.47 %	Cr_2O_3 (0.0018) %
Al_2O_3 17.89 %	PbO (0.0004) %	HfO_2 (0.0004) %
TiO_2 0.313 %	ZnO (0.0005) %	SrO (0.012) %
Fe_2O_3 0.291 %	P_2O_5 0.226 %	ThO_2 (0.0011) %
CaO 0.78 %	ZrO_2 (0.0107) %	U_3O_8 (0.0002) %
MgO 0.18 %	L.O.I. 0.72 %	Y_2O_3 (0.0023) %
Na_2O 8.89 %	BaO (0.0106) %	

(Values in parenthesis are indicative values)

BCS CRM376/1	Potash feldspar	100 g

Certified values

SiO_2 65.77 %	CaO 0.421 %	P_2O_5 (0.02) %
Al_2O_3 18.63 %	MgO (0.03) %	ZrO_2 (<0.01) %
TiO_2 (<0.01) %	Na_2O 3.00 %	L.O.I. 0.203 %
Fe_2O_3 0.085 %	K_2O 11.59 %	BaO 0.021 %
Mn_3O_4 (0.004) %	PbO 0.009 %	Cr_2O_3 0.001 %

(Values in parenthesis are indicative values)

BCS CRM388	Zircon	100 g

Certified values

SiO_2 32.7 %	MgO (<0.05) %	L.O.I. (0.2) %
Al_2O_3 0.291 %	Na_2O (<0.02) %	HfO_2 1.3 %
TiO_2 0.232 %	K_2O (<0.03) %	ThO_2 0.018 %
Fe_2O_3 0.049 %	P_2O_5 0.12 %	U_3O_8 0.034 %
CaO (0.04) %	ZrO_2 64.9 %	Y_2O_3 0.136 %

(Values in parenthesis are indicative values)

BCS CRM389/1	High purity magnesia	100 g

Certified values

SiO_2 0.274 %	MgO 97.89 %	Cr_2O_3 0.004 %
Al_2O_3 0.104 %	ZnO (0.0029) %	SrO 0.0007 %
TiO_2 0.0051 %	P_2O_5 0.0295 %	Y_2O_3 0.0029 %
Fe_2O_3 0.607 %	ZrO_2 (0.0008) %	Ni 0.0012 %
MnO 0.1 %	B_2O_3 0.015 %	
CaO 0.88 %	BaO 0.0015 %	

(Values in parenthesis are indicative values)

BCS CRM394	Calcined bauxite	100 g

Certified values

SiO_2 4.98 %	MgO 0.12 %	L.O.I. (0.4) %
Al_2O_3 88.8 %	Na_2O 0.02 %	Cr_2O_3 (0.08) %
TiO_2 3.11 %	K_2O 0.02 %	Li_2O <0.01 %
Fe_2O_3 1.9 %	P_2O_5 0.22 %	
CaO 0.08 %	ZrO_2 (0.159) %	

(Values in parenthesis are indicative values)

Code	Product	Unit
BCS CRM396	Low silica magnesite chrome	100 g

Certified values

SiO_2 1.37 %	CaO 1.12 %	B_2O_3 0.09 %
Al_2O_3 5.73 %	MgO 64.6 %	Cr_2O_3 15.6 %
TiO_2 0.26 %	Na_2O (0.06) %	Li_2O (0.05) %
Fe_2O_3 10.9 %	K_2O (0.03) %	
MnO 0.17 %	L.O.I. (0.04) %	

(Values in parenthesis are indicative values)

BCS CRM512	Dolomite	100 g

Certified values

SiO_2 0.379 %	K_2O (<0.02) %	SrO 0.024 %
Al_2O_3 0.055 %	PbO (<0.001) %	As (<0.003) %
TiO_2 0.002 %	ZnO (<0.01) %	C (12.4) %
Fe_2O_3 0.03 %	P_2O_5 (<0.02) %	Cd (<0.0003) %
MnO 0.0036 %	S (<0.05) %	F (0.01) %
CaO 30.61 %	L.O.I. 46.8 %	Ni (<0.001) %
MgO 21.59 %	BaO (<0.02) %	
Na_2O (0.1) %	Cr_2O_3 (<0.001) %	

(Values in parenthesis are indicative values)

BCS CRM513	Limestone	100 g

Certified values

SiO_2 0.228 %	K_2O 0.015 %	SrO 0.0176 %
Al_2O_3 0.108 %	PbO 0.0009Pb %	As <0.001 %
TiO_2 (0.004) %	ZnO 0.0014Zn %	C 11.9 %
Fe_2O_3 0.0275 %	P_2O_5 (0.005) %	Cd <0.001 %
MnO 0.0095 %	S 0.0097 %	F 0.002 %
CaO 55.59 %	L.O.I. 43.61 %	Ni <0.001 %
MgO 0.182 %	BaO 0.01 %	
Na_2O (<0.3) %	Cr_2O_3 0.0012 %	

(Values in parenthesis are indicative values)

Slags

ECRM-D 826-1	Phosphate slag - powder	100 g

Year of issue: 1976

Certified values

SiO_2 8.96 ± 0.15 %	Cr 0.182 ± 0.005 %	Na 0.375 ± 0.009 %
Al 0.696 ± 0.008 %	Cu (0.0019) %	Ni (0.0017) %
CaO 46.48 ± 0.54 %	F (0.3667) %	Pb (0.0049) %
MgO (2.46) %	Fe_{total} (20.73) %	V 0.503 ± 0.008 %
P_2O_5 14.65 ± 0.15 %	K 0.0278 ± 0.0017 %	V_2O_5 (0.89) %
P_2O_5 citric acid sol. 10.73 ± 0.14 %	Mn_{total} (3.46) %	
B (0.0029) %	Mo (0.0011) %	

(Values in parenthesis are indicative values)

ECRM-D 827-1	Thomas phosphate - powder	100 g

Year of issue: 1976

Certified values

SiO_2 6.21 ± 0.15 %	P_2O_5 20.70 ± 0.16 %	Mn_{total} (2.34) %
Al_2O_3 (0.57) %	P_2O_5 citric acid sol. 18.79 ± 0.22 %	V_2O_5 (1.15) %
CaO 47.38 ± 0.49 %	Cr_2O_3 (0.14) %	
MgO (3.70) %	Fe_{total} (15.72) %	

(Values in parenthesis are indicative values)

ECRM-B 851-1	Basic slag - powder	100 g

Year of issue: 1979

Certified values

Si 6.09 %	F 0.10 %	Pb (0.0028) %
Al 2.0 %	Fe 19.9 %	S 0.37 %
Ca 28.66 %	K 0.0089 %	Ti 0.25 %
Mg 2.25 %	Mn 6.17 %	V 0.13 %
P 1.33 %	Mo (0.0050) %	Zn 0.0141 %
B (0.0144) %	Na 0.061 %	
Cr 0.55 %	Ni (0.0037) %	

(Values in parenthesis are indicative values)

ECRM-B 877-1	Furnace dust - powder	100 g

Year of issue: 1977

Certified values

Si 1.08 ± 0.05 %	Cr 0.017 ± 0.001 %	Pb 1.00 ± 0.03 %
Al 0.044 ± 0.003 %	F 0.78 ± 0.05 %	S 0.18 ± 0.01 %
Ca 3.23 ± 0.11 %	Fe 62.07 ± 0.35 %	Ti 0.032 ± 0.003 %
Mg 0.28 ± 0.01 %	K 0.058 ± 0.003 %	V 0.029 ± 0.003 %
P 0.18 ± 0.01 %	Mn 1.37 ± 0.02 %	Zn 1.16 ± 0.04 %
As 0.014 ± 0.002 %	Na 0.23 ± 0.02 %	
C 0.83 ± 0.02 %	Ni 0.010 ± 0.001 %	

Code	Product	Unit
ECRM-B 879-1	Basic slag - powder	100 g

Year of issue: 1980

Certified values

Si 4.12 ± 0.03 %	P 3.69 ± 0.03 %	Mn 3.45 ± 0.04 %
SiO_2 8.82 %	P $_{citric\ acid\ sol.}$ 3.31 ± 0.10 %	MnO 4.45 %
Al 0.425 ± 0.016 %	P_2O_5 8.46 %	S 0.102 ± 0.008 %
Al_2O_3 0.803 %	P_2O_5 $_{citric\ acid\ sol.}$ 7.59 %	Ti 0.321 ± 0.005 %
Ca 31.23 ± 0.26 %	Cr 0.326 ± 0.013 %	TiO_2 0.535 %
CaO 43.70 %	Cr_2O_3 0.477 %	V 0.414 ± 0.012 %
Mg 1.32 ± 0.03 %	F 0.368 ± 0.035 %	V_2O_5 0.738 %
MgO 2.19 %	Fe 18.97 ± 0.19 %	

(Values in parenthesis are indicative values)

BCS CRM381	Basic slag	100 g

Certified values

SiO_2 8.78 %	CaO 49 %	$P_2O_{5Cit\ Sol}$ 15.2 %
TiO_2 0.35 %	MgO 1.03 %	P_2O_{5Total} 15.7 %
Al_2O_3 0.67 %	Cr_2O_3 0.33 %	S 0.19 %
Fe 13.3 %	MnO 3.16 %	
FeO 3.69 %	V_2O_5 0.94 %	

ECRM-F 802-1	Blast furnace slag - powder	100 g

Year of issue: 1971

Certified values

Si 15.16 ± 0.14 %	Cr 0.0053 ± 0.0004 %*	Pb (0.0015) %
Al 8.53 ± 0.31 %	F 0.243 ± 0.008 %*	S 0.714 ± 0.036 %
Ca 30.62 ± 0.27 %	Fe 0.576 ± 0.021 %	Ti 0.366 ± 0.018 %
Mg 2.87 ± 0.17 %	K 0.491 ± 0.006 %*	V 0.028 ± 0.002 %*
P 0.109 ± 0.011 %	Mn 0.460 ± 0.016 %	Zn 0.0025 ± 0.0005 %*
B 0.0245 ± 0.003 %*	Na 0.236 ± 0.004 %*	

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-F 803-1	Blast furnace slag - powder	100 g

Year of issue: 1971

Certified values

Si 17.01 ± 0.13 %	Mg 2.44 ± 0.19 %	Mn 0.552 ± 0.004 %
Al 6.98 ± 0.28 %	P 0.118 ± 0.011 %	S 0.767 ± 0.044 %
Ca 30.93 ± 0.25 %	Fe 0.613 ± 0.025 %	Ti 0.301 ± 0.017 %

ECRM-F 804-1	Basic slag - powder	100 g

Year of issue: 1971

Certified values

Si 2.59 ± 0.09 %	P 7.67 ± 0.10 %	Ti 0.152 ± 0.014 %
Al (0.407) %	Fe 11.92 ± 0.27 %	V 0.460 ± 0.024 %
Ca 36.88 ± 0.34 %	Mn 1.48 ± 0.04 %	
Mg 0.88 ± 0.15 %	S 0.127 ± 0.015 %	

(Values in parenthesis are indicative values)

ECRM-F 805-1	Basic slag - powder	100 g

Year of issue: 1972

Certified values

Si 3.10 ± 0.04 %	P 7.07 ± 0.05 %	Ti 0.205 ± 0.008 %
Al 0.326 ± 0.013 %	Fe 14.87 ± 0.07 %	V 0.514 ± 0.009 %
Ca 34.96 ± 0.12 %	Mn 1.59 ± 0.03 %	
Mg 1.12 ± 0.05 %	S 0.092 ± 0.005 %	

ECRM-F 806-1	Basic slag - powder	100 g

Year of issue: 1972

Certified values

Si 5.48 ± 0.06 %	P 0.982 ± 0.022 %	Ti 0.302 ± 0.008 %
Al 0.477 ± 0.020 %	Fe 17.89 ± 0.10 %	V 0.288 ± 0.009 %
Ca 32.97 ± 0.19 %	Mn 4.60 ± 0.06 %	
Mg 1.82 ± 0.06 %	S 0.110 ± 0.004 %	

(Values in parenthesis are indicative values)

Code	Product	Unit
ECRM-F 876-1	Electric furnace dust - powder Year of issue: 1977 Certified values Si 1.72 ± 0.04 %, SiO_2 3.67 %, Al 0.34 ± 0.03 %, Al_2O_3 0.63 %, Ca 3.43 ± 0.13 %, CaO 4.80 %, Mg 1.31 ± 0.03 %, MgO 2.17 %, P 0.128 ± 0.007 %, As 0.023 ± 0.001 %, C 0.26 ± 0.01 %, Cd 0.13 ± 0.01 %, Cl 3.63 ± 0.08 %, Cr 0.17 ± 0.01 %, F 0.24 ± 0.03 %, Fe 24.85 ± 0.17 %, K 1.63 ± 0.06 %, K_2O 1.96 %, Mn 2.84 ± 0.04 %, MnO 3.67 %, Na 1.98 ± 0.07 %, Na_2O 2.67 %, Ni 0.034 ± 0.003 %, Pb 7.82 ± 0.23 %, S 0.87 ± 0.07 %, Sn 0.094 ± 0.004 %, Ti 0.048 ± 0.004 %, TiO_2 0.080 %, Zn 23.29 ± 0.32 % (Values in parenthesis are indicative values)	100 g
ECRM-F 878-1	Blast furnace slag - powder Year of issue: 1977 Certified values Si 15.77 ± 0.08 %, SiO_2 33.73 %, Al 8.45 ± 0.10 %, Al_2O_3 15.97 %, Ca 25.46 ± 0.13 %, CaO 35.63 %, Mg 5.80 ± 0.07 %, MgO 9.62 %, P 0.013 ± 0.001 %, P_2O_5 0.029 %, F 0.15 ± 0.01 %, Fe 0.60 ± 0.03 %, K 1.07 ± 0.03 %, K_2O 1.29 %, Mn 0.99 ± 0.01 %, MnO 1.28 %, Na 0.35 ± 0.02 %, Na_2O 0.47 %, S 0.83 ± 0.02 %, Ti 0.37 ± 0.01 %, TiO_2 0.62 % (Values in parenthesis are indicative values)	100 g

Steel with oxygen and nitrogen content

ECRM-D 026-1	Rolled wire for the determination of oxygen and nitrogen - rods Year of issue: 1969 Certified values O 0.0031 ± 0.0003 %, N 0.0053 ± 0.0004 %	100 g
ECRM-D 026-1-S	Rolled wire for the determination of oxygen and nitrogen - set rods	5 x 100 g
ECRM-D 026-2	Rolled wire for the determination of oxygen and nitrogen - rod Year of issue: 1973 Certified values O 0.0025 ± 0.0004 %, N 0.0042 ± 0.0003 %	100 g
ECRM-D 026-2-S	Rolled wire for the determination of oxygen and nitrogen - set rod	5 x 100 g
ECRM-D 027-1	Rolled wire for the determination of oxygen and nitrogen - rod Year of issue: 1970 Certified values O 0.0084 ± 0.0006 %, N 0.0157 ± 0.0010 %	100 g
ECRM-D 027-1-S	Rolled wire for the determination of oxygen and nitrogen - set rod	5 x 100 g
ECRM-D 028-1	Rolled wire for the determination of oxygen and nitrogen - rod Year of issue: 1970 Certified values O 0.0113 ± 0.0007 %, N 0.0029 ± 0.0005 %	100 g
ECRM-D 028-1-S	Rolled wire for the determination of oxygen and nitrogen - set rod	5 x 100 g
ECRM-D 029-1	Rolled wire for the determination of oxygen and nitrogen - rod Year of issue: 1970 Certified values O 0.0312 ± 0.0010 %, N 0.0083 ± 0.0008 %	100 g
ECRM-D 029-1-S	Rolled wire for the determination of oxygen and nitrogen - set rod	5 x 100 g
ECRM-D 099-1	Ball bearing steel for the determination of oxygen and nitrogen Year of issue: 1987 Certified values O 0.0008 ± 0.0002 %, N 0.0078 ± 0.0005 %	100 g

Non ferrous metals and alloys

Code	Product	Unit
ECRM-D 284-2	Stainless steel, 17% chromium, 11% nickel and 2% molybdenum, no. 1.4571 - chips Year of issue: 2000 Certified values	100 g

C ..... 0.0201 ± 0.0005 %*	Al ..... 0.0027 ± 0.0004 %*	Ti ..... 0.191 ± 0.004 %*
Si ..... 0.537 ± 0.008 %*	As ..... 0.0063 ± 0.0003 %*	V ..... 0.0425 ± 0.0016 %*
Mn ..... 1.745 ± 0.009 %*	B ..... 0.0026 ± 0.0001 %*	W ..... (0.0183) %
P ..... 0.0258 ± 0.0008 %*	Co ..... 0.0525 ± 0.0011 %*	Zr ..... (0.0005) %
S ..... 0.0237 ± 0.0005 %*	Cu ..... 0.1831 ± 0.0014 %*	O ..... 0.0099 ± 0.0007[1] %
Cr ..... 16.811 ± 0.019 %*	N ..... 0.0151 ± 0.0002 %*	Ta ..... (0.0013) %
Mo ..... 2.111 ± 0.010 %*	Nb ..... (0.0028) %	
Ni ..... 10.72 ± 0.05 %*	Sn ..... 0.0047 ± 0.0002 %*	

(Values in parenthesis are indicative values)

* 95%-confidence interval
[1] Oxygen content only certified for the chips

ECRM-D 286-1	Stainless steel, 18% chromium, 8.5% nickel, 0.3% molybdenum and 0.3% sulfur, no. 1.4305 - chips Year of issue: 1985 Certified values	100 g

C ..... 0.100 ± 0.005	Mo ..... 0.329 ± 0.009 %	N ..... 0.043 ± 0.002 %
Mn ..... 1.92 ± 0.03 %	Ni ..... 8.54 ± 0.04 %	Pb ..... (0.0003) %
P ..... 0.026 ± 0.002 %	Al ..... (0.0023) %	Sn ..... 0.0084 ± 0.0009 %
S ..... 0.280 ± 0.014 %	B ..... (0.0003) %	O ..... (0.0315) %
Cr ..... 18.13 ± 0.08 %	Co ..... 0.150 ± 0.008 %	Sb ..... 0.0014± 0.0004 %

(Values in parenthesis are indicative values)

ECRM-S 274-1	Vanadium steel - chips Year of issue: 2004 Certified values	100 g

C ..... 1.563 ± 0.006 %*	Ni ..... 0.077 ± 0.002 %*	Pb ..... (0.0064) %
Si ..... 1.057 ± 0.008 %*	Al ..... (0.0025) %	Sn ..... (0.010) %
Mn ..... 0.397 ± 0.004 %*	As ..... (0.0013) %	Ti ..... (0.0011) %
P ..... 0.0148 ± 0.0005 %*	B ..... (0.0005) %	V ..... 4.010 ± 0.018 %*
S ..... 0.0096 ± 0.0004 %*	Co ..... (0.0229) %	W ..... 0.0087 ± 0.0007 %*
Cr ..... 8.036 ± 0.022 %*	Cu ..... 0.0281 ± 0.0005 %*	O ..... 0.0026 ± 0.0002+1) %
Mo ..... 1.455 ± 0.016 %*	N ..... 0.0769 ± 0.0010 %*	Sb ..... (0.00019) %

(Values in parenthesis are indicative values)

* 95%-confidence interval

ECRM-S 274-1-D	Vanadium steel - disc (38 mm x 25 mm)	disc

Setting-up sample for spectrometric analysis of low alloyed steels

BAM SUS-1 R	Setting-up sample for spectrometric analysis of low alloyed steels Uncertified mass fractions	cylinder

C ..... 0.9 %	Cr ..... 1.7 %	Cu ..... 0.7 %
Si ..... 0.8 %	Mo ..... 0.9 %	Co ..... 0.3 %
Mn ..... 1.1 %	Ni ..... 2.9 %	Nb ..... 0.55 %
P ..... 0.02 %	V ..... 0.5 %	
S ..... 0.017 %	W ..... 0.7 %	

Non ferrous metals and alloys

Aluminium base standards

Code	Product	Unit
BAM-M315	Aluminium alloy AlSi9Cu3 Year of issue: 2006 Certified values	disc

Si ..... 9.18 ± 0.21 %	B ..... (< 3) µg/g	Na ..... (~ 15) µg/g **
Fe ..... 0.59 ± 0.02 %	Be ..... 5 ± 2 µg/g	P ..... (13 ± 7) µg/g
Cu ..... 2.51 ± 0.09 %	Bi ..... 41 ± 7 µg/g	Pb ..... 0.079 ± 0.004
Mn ..... 0.314 ± 0.007 %	Ca ..... (~ 15) µg/g **)	Sb ..... (32 ± 24) µg/g
Mg ..... 0.422 ± 0.012 %	Cd ..... 11 ± 4 µg/g	Sn ..... 0.0771 ± 0.0025 %
Cr ..... 0.0311 ± 0.0007 %	Co ..... (< 3) µg/g	Sr ..... (~ 70) µg/g **
Ni ..... 0.096 ± 0.003 %	Ga ..... 101 ± 5 µg/g	V ..... 54 ± 2.5 µg/g
Zn ..... 0.77 ± 0.02 %	Hg ..... (33 ± 2) µg/g	Zr ..... 30 ± 7 µg/g
Ti ..... 0.143 ± 0.005 %	Li ..... (~ 7) µg/g **	

(Values in parenthesis are indicative values)

** the given values are average values. the exact value must be calculated for each single sample

Code	Product	Unit
BAM-307	Aluminium alloy AlMg4,5Mn - disc (60 mm x 25 mm)	disc

Year of issue: 1990

Certified values

Si ..... 0.155 ± 0.005 %	Cr ..... 0.162 ± 0.003 %	Cd ..... 0.00489 ± 0.00009 %
Fe ..... 0.412 ± 0.004 %	Zn ..... 0.0634 ± 0.0006 %	Li ..... 0.00044 ± 0.00003 %
Cu ..... 0.1043 ± 0.0012 %	Ti ..... 0.1009 ± 0.0012 %	Na ..... 0.00214 ± 0.00008 %
Mn ..... 0.701 ± 0.004 %	Be ..... 0.0011 ± 0.00003 %	
Mg ..... 4.576 ± 0.021 %	Ca ..... 0.00053 ± 0.00005 %	

BAM-308	Aluminium alloy AlZnMgCu1,5 - disc (60 mm x 25 mm)	disc

Year of issue: 1990

Certified values

Si ..... 0.0707 ± 0.0024 %	Mg ..... 2.290 ± 0.013 %	Ti ..... 0.0285 ± 0.0009 %
Fe ..... 0.1634 ± 0.0027 %	Cr ..... 0.1962 ± 0.0024 %	Be ..... 0.00022 ± 0.00001 %
Cu ..... 1.315 ± 0.011 %	Ni ..... 0.0122 ± 0.0004 %	Zr ..... 0.0078 ± 0.0004 %
Mn ..... 0.0342 ± 0.0009 %	Zn ..... 5.67 ± 0.04 %	

BAM-310	Aluminium alloy Al99,85Mg1 - disc (60 mm x 25 mm)	disc

Year of issue: 1993

Certified values

Si ..... 0.0797 ± 0.0012 %	Ti ..... 0.00301 ± 0.00011 %	Na ..... (0.0003) %
Fe ..... 0.0705 ± 0.0012 %	B ..... (0.0006) %	P ..... (0.0003) %
Cu ..... 0.00169 ± 0.00009 %	Be ..... 0.000128 ± 0.000014 %	Pb ..... 0.00347 ± 0.00025 %
Mn ..... 0.00307 ± 0.00011 %	Ca ..... 0.00073 ± 0.00004 %	Sn ..... 0.00238 ± 0.00018 %
Mg ..... 0.994 ± 0.015 %	Cd ..... 0.00237 ± 0.00007 %	V ..... 0.00444 ± 0.00023 %
Cr ..... 0.00090 ± 0.00012 %	Co ..... (0.0009) %	Zr ..... 0.00135 ± 0.00019 %
Ni ..... 0.00244 ± 0.00014 %	Ga ..... 0.01152 ± 0.00024 %	
Zn ..... 0.0086 ± 0.0004 %	Li ..... 0.000366 ± 0.000012 %	

(Values in parenthesis are indicative values)

BAM-311	Aluminium alloy AlCuMg2 - disc (60 mm x 25 mm)	disc

Year of issue: 1993

Certified values

Si ..... 0.2040 ± 0.0029 %	Zn ..... 0.2005 ± 0.0022 %	Ga ..... 0.0159 ± 0.0005 %
Fe ..... 0.310 ± 0.006 %	Ti ..... 0.0562 ± 0.0006 %	Li ..... 0.00053 ± 0.00005 %
Cu ..... 4.653 ± 0.028 %	Be ..... 0.00052 ± 0.00004 %	Na ..... (0.0018) %
Mn ..... 0.694 ± 0.006 %	Bi ..... 0.0500 ± 0.0030 %	Pb ..... 0.0504 ± 0.0011 %
Mg ..... 1.567 ± 0.014 %	Ca ..... (0.0006) %	Sn ..... 0.0127 ± 0.0012 %
Cr ..... 0.1037 ± 0.0014 %	Cd ..... 0.00127 ± 0.00005 %	V ..... 0.0240 ± 0.0008 %
Ni ..... 0.0519 ± 0.0009 %	Co ..... 0.00115 ± 0.00010 %	Zr ..... 0.140 ± 0.005 %

(Values in parenthesis are indicative values)

BAM-312	Aluminium alloy AlMgSi0,5 - disc (60 mm x 25 mm)	disc

Year of issue: 1995

Certified values

Si ..... 0.415 ± 0.006 %	Ni ..... 0.00452 ± 0.00015 %	Pb ..... 0.00439 ± 0.00025 %
Fe ..... 0.185 ± 0.004 %	Zn ..... 0.0290 ± 0.0004 %	Sn ..... (0.002) %
Cu ..... 0.0419 ± 0.0008 %	Ti ..... 0.0288 ± 0.0004 %	Sr ..... 0.00082 ± 0.00010 %
Mn ..... 0.0416 ± 0.0008 %	Bi ..... 0.0023 ± 0.0004 %	V ..... 0.00615 ± 0.00023 %
Mg ..... 0.410 ± 0.005 %	Cd ..... 0.00226 ± 0.00010 %	Zr ..... 0.00101 ± 0.00005 %
Cr ..... 0.0276 ± 0.0008 %	Ga ..... 0.0115 ± 0.0004 %	

(Values in parenthesis are indicative values)

BAM-314	Aluminium alloy AlSi11Cu2(Fe) - disc (60 mm x 25 mm)	disc

Year of issue: 1999

Certified values

Si ..... 11.49 ± 0.10 %	Zn ..... 1.195 ± 0.012 %	Ga ..... 0.0154 ± 0.0006 %
Fe ..... 0.757 ± 0.007 %	Ti ..... 0.1638 ± 0.0025 %	Pb ..... 0.221 ± 0.006 %
Cu ..... 2.071 ± 0.0019 %	As ..... 0.00279 ± 0.00020 %	Sb ..... 0.0093 ± 0.0005 %
Mn ..... 0.400 ± 0.003 %	Be ..... 0.000396 ± 0.000021 %	Sn ..... 0.199 ± 0.005 %
Mg ..... 0.1805 ± 0.0029 %	Bi ..... 0.0094 ± 0.0004 %	V ..... 0.0192 ± 0.0005 %
Cr ..... 0.0517 ± 0.0008 %	Cd ..... 0.00130 ± 0.00005 %	Zr ..... 0.00552 ± 0.00013 %
Ni ..... 0.221 ± 0.003 %	Co ..... 0.00532 ± 0.00021 %	

ERM-EB313	Aluminium alloy AlMg3 - disc (60 mm x 25 mm) (BAM-313)	disc

Year of issue: 1997

Certified values

Si ..... 0.363 ± 0.007 %	As ..... 0.00072 ± 0.00007 %	Na ..... 0.00370 ± 0.00024 %
Fe ..... 0.391 ± 0.003 %	Be ..... 0.000547 ± 0.00002 %	Pb ..... 0.00433 ± 0.00028 %
Cu ..... 0.0932 ± 0.0014 %	Bi ..... 0.0095 ± 0.0008 %	Sb ..... 0.00087 ± 0.00019 %
Mn ..... 0.495 ± 0.003 %	Ca ..... 0.00057 ± 0.00008 %	Sn ..... 0.0197 ± 0.0006 %
Mg ..... 3.40 ± 0.04 %	Cd ..... 0.00074 ± 0.00004 %	Tl ..... 0.00064 ± 0.00004 %
Cr ..... 0.1224 ± 0.0012 %	Ga ..... 0.0121 ± 0.0005 %	V ..... 0.0299 ± 0.0006 %
Ni ..... 0.0278 ± 0.0006 %	Hg ..... 0.00041 ± 0.00004 %	Zr ..... 0.0359 ± 0.0019 %
Zn ..... 0.1579 ± 0.0015 %	Li ..... 0.000604 ± 0.00001 %	
Ti ..... 0.0947 ± 0.0014 %	Mo ..... 0.00053 ± 0.00012 %	

Non ferrous metals and alloys

Code	Product	Unit
BAM 201	Aluminium alloy GAlSi12 - chips	100 g

Year of issue: 1963

Certified values

Si 13.20 %	Fe 0.18 %	Zn 0.038 %
Mg 0.0024 %	Mn 0.38 %	
Cu 0.009 %	Ti 0.011 %	

BAM 209	Aluminium alloy GAlSi10Mg - chips	100 g

Year of issue: 1963

Certified values

Si 9.65 %	Fe 0.18 %	Zn 0.021 %
Mg 0.31 %	Mn 0.36 %	
Cu 0.004 %	Ti 0.023 %	

BAM 300	Aluminium alloy AlMg3 - chips	100 g

Year of issue: 1959

Certified values

Si 0.14 %	Mn 0.018 %	Ti 0.011 %
Mg 2.67 %	Cr 0.23 %	Zn 0.128 %
Cu 0.046 %	Pb 0.016 %	
Fe 0.203 %	Sn (< 0.0005) %	

(Values in parenthesis are indicative values)

BAM 301	Aluminium 99.8 - chips	100 g

Year of issue: 1961

Certified values

Si 0.061 %	Fe 0.054 %	Ti 0.005 %
Mg 0.0008 %	Mn 0.001 %	V 0.0018 %
Cu 0.0016 %	Sn (< 0.0005) %	Zn 0.033 %

(Values in parenthesis are indicative values)

Copper base standards

BAM-M381	Pure copper - disc (40 mm x 30 mm)	disc

Year of issue: 2006

Certified values

Al (< 1) µg/g	Bi < 0.3 µg/g	Sb < 1 µg/g
Ni 0.7 ± 0.2 µg/g	Cd < 0.4 µg/g	Se (< 1) µg/g
Fe 3.3 ± 0.2 µg/g	Co < 0.3 µg/g	Si (< 3) µg/g
Mn 0.22 ± 0.03 µg/g	Cr < 0.4 µg/g	Sn 3.86 ± 0.25 µg/g
Zn 5.3 ± 0.3 µg/g	Mg < 0.6 µg/g	Te (< 0.3) µg/g
Ag < 1 µg/g	Pb 0.59 ± 0.07 µg/g	Ti (< 0.3) µg/g
As < 0.5 µg/g	S (3.2 ± 1.3) µg/g	Zr < 6 µg/g

(Values in parenthesis are indicative values)

BAM-M382	Pure copper - disc (40 mm x 30 mm)	disc

Year of issue: 2006

Certified values

Al < 2.5 µg/g	Bi 0.53 ± 0.03 µg/g	Sb 0.7 ± 0.2 µg/g
Ni 1.7 ± 0.2 µg/g	Cd 0.90 ± 0.09 µg/g	Se 0.6 ± 0.1 µg/g
Fe 6.0 ± 0.4 µg/g	Co 0.73 ± 0.07 µg/g	Si < 6 µg/g
Mn 0.76 ± 0.06 µg/g	Cr 0.56 ± 0.06 µg/g	Sn 4.29 ± 0.21 µg/g
Zn 6.0 ± 0.5 µg/g	Mg (1.4 ± 0.3) µg/g	Te 0.61 ± 0.06 µg/g
Ag 1.8 ± 0.2 µg/g	Pb 1.0 ± 0.2 µg/g	Ti (0.6 ± 0.2) µg/g
As (0.6 ± 0.2) µg/g	S (3.2 ± 1.4) µg/g	Zr < 3 µg/g

(Values in parenthesis are indicative values)

BAM-M383	Pure copper - disc (40 mm x 30 mm)	disc

Year of issue: 2005

Certified values

Al (2.3 ± 0.6) µg/g	Bi 1.02 ± 0.09 µg/g	Sb 1.44 ± 0.17 µg/g
Ni 3.59 ± 0.21 µg/g	Cd 1.48 ± 0.15 µg/g	Se (1.16 ± 0.19) µg/g
Fe 10.9 ± 0.5 µg/g	Co 1.37 ± 0.05 µg/g	Si < 10 µg/g
Mn 1.24 ± 0.05 µg/g	Cr 1.03 ± 0.09 µg/g	Sn 4.7 ± 0.6 µg/g
Zn (7.8 ± 0.4) µg/g	Mg 2.37 ± 0.29 µg/g	Te 1.40 ± 0.16 µg/g
Ag 4.70 ± 0.20 µg/g	Pb 1.31 ± 0.20 µg/g	Ti 1.56 ± 0.16 µg/g
As 1.93 ± 0.15 µg/g	S (2.8 ± 1.4) µg/g	

(Values in parenthesis are indicative values)

Code	Product	Unit
BAM-M384	Pure copper - disc (40 mm x 30 mm) Year of issue: 2005 Certified values	disc

Al 13.0 ± 0.8 µg/g	Bi 3.34 ± 0.22 µg/g	Sb 12.0 ± 0.4 µg/g
Ni 5.7 ± 0.4 µg/g	Cd 3.95 ± 0.09 µg/g	Se 4.24 ± 0.19 µg/g
Fe 32.8 ± 1.9 µg/g	Co 3.88 ± 0.16 µg/g	Si (5.0 ± 0.7) µg/g
Mn 6.88 ± 0.15 µg/g	Cr 6.53 ± 0.21 µg/g	Sn (10.2 ± 0.9) µg/g
Zn (12.7 ± 2.1) µg/g	Mg 14.6 ± 0.5 µg/g	Te 7.0 ± 0.5 µg/g
Ag 10.3 ± 0.4 µg/g	Pb 5.7 ± 0.5 µg/g	Ti (2.10 ± 0.23) µg/g
As 5.0 ± 0.4 µg/g	S (4.1 ± 1.0) µg/g	Zr < 9 µg/g

(Values in parenthesis are indicative values)

BAM-229	Copper-alloy CuZn37 - chips Year of issue: 1996 Certified values	100 g

Cu 63.334 ± 0.007% %	Fe 106.1 ± 2.1 µg/g	Sb 7.2 ± 0.7 µg/g
Zn 36.63 ± 0.04% %	Ni 111.4 ± 0.9 µg/g	Se 34 ± 4 µg/g
Sn 48.5 ± 1.1 µg/g	As 21.7 ± 0.8 µg/g	
Pb 192 ± 5 µg/g	P (10.6 ± 1.6) µg/g	

(Values in parenthesis are indicative values)

BAM-365	Refined copper - chips Year of issue: 1996 Certified values	100 g

Cu 99.937 ± 0.012% %	Mn (< 1) µg/g	S (7.7 ± 1.4) µg/g
Sn (< 5) µg/g	Ag 102.7 ± 1.7 µg/g	Sb 8.8 ± 0.3 µg/g
Pb 28.8 ± 1.3 µg/g	As 29.8 ± 1.0 µg/g	Te 4.6 ± 0.6 µg/g
Fe 22.3 ± 1.3 µg/g	Bi 29.4 ± 1.4 µg/g	
Ni 175.3 ± 1.5 µg/g	Co 23.6 ± 1.4 µg/g	

(Values in parenthesis are indicative values)

BAM-366	SF-copper - chips Year of issue: 1992 Certified values	100 g

Zn 15.6 ± 1.2 %	Ag 7.9 ± 0.8 %	S 8.7 ± 0.6 %
Sn 111 ± 3 %	As 1.11 ± 0.08 %	Sb 0.99 ± 0.10 %
Pb 10.8 ± 0.5 %	Bi (< 0.3) %	Se (< 1.1) %
Fe 23.4 ± 0.5 %	Cd 0.27 ± 0.04 %	Te (< 0.3) %
Ni 3.2 ± 0.7 %	P 263 ± 6 %	

(Values in parenthesis are indicative values)

BAM-366-D	SF-copper	disc
BAM-367	Copper-alloy CuNi10Fe1Mn - disc (40 mm x 30 mm) Year of issue: 1995 Certified values	disc

Cu 87.88 ± 0.04% %	Zn 715 ± 9 %	P 124 ± 6 %
Ni 9.72 ± 0.05% %	C 28.7 ± 0.6 %	Pb 298 ± 6 %
Fe 1.443 ± 0.012% %	Co 498 ± 3 %	S 162 ± 9 %
Mn 0.723 ± 0.005% %	Mg 347 ± 13 %	Sn 105 ± 4 %

BAM-368	Copper-alloy CuZn20Al2- disc (40 mm x 30 mm) Year of issue: 1993 Certified values	disc

Cu 77.049 ± 0.018% %	Mn 202.8 ± 2.4 µg/g	Pb 131.3 ± 2.4 µg/g
Al 1.972 ± 0.014% %	As 246 ± 9 µg/g	S (18.5 ± 2.9) µg/g
Ni 258 ± 4 µg/g	Mg 62.1 ± 1.5 µg/g	Si 130 ± 7 µg/g
Fe 192.7 ± 2.9 µg/g	P 89.9 ± 1.6 µg/g	Sn 147 ± 4 µg/g

(Values in parenthesis are indicative values)

BAM-369	OF-copper- disc (40 mm x 30 mm) Year of issue: 1993 Certified values	disc

Zn 22.0 ± 0.6 %	Co 10.42 ± 0.29 %	Mg 3.60 ± 0.18 %
Bi 9.7 ± 0.4 %	Cr 9.2 ± 0.5 %	

BAM-370	OF-copper- disc (40 mm x 30 mm) Year of issue: 1993 Certified values	disc

Al 12.6 ± 0.8 %	Pb 15.8 ± 1.1 %	Si 18.7 ± 3.0 %
P 11.7 ± 0.7 %	Sb 15.6 ± 1.3 %	Sn 16.8 ± 0.9 %

BAM-371	OF-copper- disc (40 mm x 30 mm) Year of issue: 1995 Certified values	disc

Fe 18.3 ± 0.7 %	Cd 1.63 ± 0.08 %	Te 14.4 ± 0.6 %
Be 11.5 ± 0.6 %	S 12.1 ± 0.9 %	Ti 12.9 ± 0.7 %

Code	Product	Unit
BAM-372	OF-copper- disc (40 mm x 30 mm) Year of issue: 1995 Certified values	disc

Ni 11.66 ± 0.24 %	Ag 9.01 ± 0.29 %	Se (8.4 ± 0.6) %
Mn 11.4 ± 0.4 %	As 10.3 ± 0.6 %	Zr 5.8 ± 0.4 %

(Values in parenthesis are indicative values)

BAM-373/1-3	E-copper with increasing P-contents - disc (50 mm x 30 mm) Set of BAM-373/1, BAM-373/2 and BAM-373/3 Certified values

BAM-373/1
P 33.8 ± 1.2 µg/g

BAM-373/2
P 226.5 ± 1.7 µg/g

BAM-373/3
P 455.7 ± 1.7 µg/g

set of discs

BAM-376	Pure copper - disc (40 mm x 30 mm) Year of issue: 1996 Certified values

Al (181.5 ± 10) %	Bi 200 ± 5 %	Sb 202 ± 5 %
Ni 209 ± 6 %	Cd 186.1 ± 2.5 %	Se 210 ± 4 %
Fe 234.6 ± 2.7 %	Co 207.9 ± 1.8 %	Sn 247.3 ± 2.9 %
Mn 205.9 ± 2.5 %	Cr (400 ± 9) %	Te 215 ± 7 %
Zn 217.3 ± 2.7 %	Mg 124 ± 4 %	Ti (4.5 ± 1.7) %
Ag 163.0 ± 2.4 %	P 203 ± 5 %	Zr 42.2 ± 1.9 %
As 199.9 ± 2.5 %	Pb 236 ± 4 %	
Be 40.6 ± 0.9 %	S 133 ± 5 %	

(Values in parenthesis are indicative values)

disc

ERM-EB374	Copper-alloy CuSn8 - cylinder (40 mm x 30 mm) (BAM-374) Year of issue: 1999 Certified values

Cu 92.22 ± 0.04%	Bi (2.2 ± 1.3) µg/g	Sb (6.3 ± 1.4) µg/g
Al (< 1) µg/g	Cd (< 1) µg/g	Se (< 2) µg/g
Ni 32.7 ± 1.3 µg/g	Co (< 1) µg/g	Si (< 10) µg/g
Fe 40 ± 4 µg/g	Cr (< 1) µg/g	Sn 7.60% ± 0.13%
Mn 4.3 ± 0.3 µg/g	Mg (< 1) µg/g	Te (< 1) µg/g
Zn 40.4 ± 1.9 µg/g	P 0.1697 ± 0.0023%	Ti (< 1) µg/g
Ag 12.1 ± 1.3 µg/g	Pb 8.3 ± 0.9 µg/g	Zr (< 1) µg/g
As (4.3 ± 1.2) µg/g	S (13 ± 5) µg/g	

(Values in parenthesis are indicative values)

cylinder

ERM-EB375	Copper-alloy CuZn39Pb3 - cylinder (40 mm x 30 mm) (BAM-375) Year of issue: 1999 Certified values

Cu 58.32 ± 0.05 %	Ag 166 ± 4 µg/g	Pb 2.90 ± 0.03 %
Al 270 ± 5 µg/g	As 231 ± 4 µg/g	Sb 122 ± 4 µg/g
Ni 0.1053 ± 0.0015 %	Bi 68.6 ± 2.5 µg/g	Si 211 ± 14 µg/g
Fe 0.207 ± 0.004 %	Cd 85.9 ± 2.1 µg/g	Sn 0.2090 ± 0.0024 %
Mn 222 ± 3 µg/g	Co 196.4 ± 2.8 µg/g	Te 53.8 ± 2.4 µg/g
Zn 38.02 ± 0.08 %	P (8.6 ± 1.2) µg/g	

cylinder

ERM-EB377	Copper-alloy CuSn6 - cylinder (40 mm x 30 mm) Year of issue: 1999 Certified values

Cu 94.04 ± 0.05 %	Bi 42.2 ± 1.5 µg/g	Sb 13.0 ± 1.3 µg/g
Al 45.1 ± 1.2 µg/g	Cd (< 1) µg/g	Se 55 ± 4 µg/g
Ni 107.4 ± 1.5 µg/g	Co (< 2) µg/g	Si (134) µg/g
Fe 104.2 ± 2.7 µg/g	Cr 66.9 ± 2.1 µg/g	Sn 5.92 ± 0.13 %
Mn 92.1 ± 2.1 µg/g	Mg (< 1) µg/g	Te (< 1) µg/g
Zn 100.6 ± 3.0 µg/g	P (< 10) µg/g	Ti (< 1) µg/g
Ag 64.4 ± 1.1 µg/g	Pb 44.9 ± 2.3 µg/g	
As (< 10) µg/g	S (6.8 ± 0.8) µg/g	

(Values in parenthesis are indicative values)

cylinder

ERM-EB378	Copper-alloy CuSn6 - cylinder (40 mm x 30 mm) (BAM-378) Year of issue: 2000 Certified values

Cu 94.13 ± 0.04 %	Bi (< 1) µg/g	Sb 86.1 ± 2.6 µg/g
Al (< 1) µg/g	Cd 100.7 ± 2.2 µg/g	Se (< 2) µg/g
Ni 18.3 ± 0.9 µg/g	Co 89 ± 5 µg/g	Si (< 10) µg/g
Fe 182 ± 7 µg/g	Cr 311 ± 5 µg/g	Sn 5.74 ± 0.21 %
Mn (0.74 ± 0.24) µg/g	Mg 28.7 ± 0.8 µg/g	Te 85.0 ± 2.6 µg/g
Zn (7.4 ± 1.0) µg/g	P 602 ± 23 µg/g	Ti (29.4 ± 4) µg/g
Ag 26.6 ± 1.3 µg/g	Pb 4.2 ± 0.7 µg/g	Zr (1.7 ± 0.09) µg/g
As 99.5 ± 2.5 µg/g	S 9.1 ± 1.9 µg/g	

(Values in parenthesis are indicative values)

cylinder

Code	Product	Unit

ERM-EB385 — Pure copper - cylinder (40 mm x 30 mm) (BAM-M385) — cylinder

Year of issue: 2003

Certified values

Al 28.6 ± 2.5 µg/g	Cd 5.8 ± 0.3 µg/g	Se 7.2 ± 0.5 µg/g
Ni 11.9 ± 0.8 µg/g	Co 6.93 ± 0.15 µg/g	Si (7.2 ± 1.5) µg/g
Fe 45.4 ± 1.4 µg/g	Cr 9.81 ± 0.20 µg/g	Sn 18.0 ± 0.9 µg/g
Mn 10.1 ± 0.2 µg/g	Mg 29.1 ± 1.3 µg/g	Te 10.0 ± 0.4 µg/g
Zn 57.9 ± 4.0 µg/g	P 12.9 ± 1.0 µg/g	Ti 3.83 ± 0.17 µg/g
Ag 28.6 ± 0.8 µg/g	Pb 11.3 ± 0.5 µg/g	Zr (< 7) µg/g
As 11.4 ± 0.8 µg/g	S 31.3 ± 1.5 µg/g	
Bi 5.81 ± 0.17 µg/g	Sb 19.9 ± 0.8 µg/g	

(Values in parenthesis are indicative values)

ERM-EB386 — Pure copper- cylinder (40 mm x 30 mm) (BAM-M386) — cylinder

Year of issue: 2003

Certified values

Al 36.5 ± 2.5 µg/g	Cd 7.8 ± 0.4 µg/g	Se 11.6 ± 0.3 µg/g
Ni 25.0 ± 1.0 µg/g	Co 5.20 ± 0.14 µg/g	Si (14.3 ± 4.3) µg/g
Fe 64.7 ± 1.8 µg/g	Cr 12.4 ± 0.7 µg/g	Sn 28.3 ± 0.8 µg/g
Mn 13.3 ± 0.2 µg/g	Mg 36.1 ± 1.2 µg/g	Te 38.3 ± 0.9 µg/g
Zn 49.5 ± 1.6 µg/g	P 7.2 ± 0.7 µg/g	Ti 33.1 ± 1.3 µg/g
Ag 47.4 ± 1.2 µg/g	Pb 23.4 ± 1.2 µg/g	Zr (8.9 ± 1.7) µg/g
As 24.2 ± 1.0 µg/g	S 21.9 ± 2.1 µg/g	
Bi 9.6 ± 0.5 µg/g	Sb 31.2 ± 1.1 µg/g	

(Values in parenthesis are indicative values)

ERM-EB387 — Copper alloy CuZn20Ni5 - cylinder (40 mm x 30 mm) (BAM-M387) — cylinder

Year of issue: 2004

Certified values

Cu 75.18 ± 0.04 %	Mn 796 ± 6 µg/g	Sn 30.1 ± 1.2 µg/g
Ni 5.020 ± 0.025 %	Zn 19.57 ± 0.06 %	
Fe 617 ± 10 µg/g	Pb 10.8 ± 0.8 µg/g	

ERM-EB388 — Copper alloy CuAl5Zn5Sn - cylinder (40 mm x 30 mm) (BAM-M388) — cylinder

Year of issue: 2004

Certified values

Cu 89.27 ± 0.05 %	Fe 303 ± 9µg/g	Pb 9.69 ± 0.83 µg/g
Al 4.972 ± 0.024 %	Mn 512 ± 6 µg/g	Sn 0.857 ± 0.011 %
Ni 73.6 ± 2.0 µg/g	Zn 4.81 ± 0.03 %	

BAM 211 — Copper-alloy G-SnBz10 — 100 g

Year of issue: 1974

Certified values

Cu 87.71 ± 0.03 %	Ni 0.122 ± 0.002 %	Cd 0.00144 ± 0.00005 %
Sn 10.60* ± 0.04 %	Mn 0.0019 ± 0.0002 %	P 0.0267 ± 0.0005 %
Zn 0.56 ± 0.02 %	Ag 0.059 ± 0.002 %	S 0.0211 ± 0.0006 %
Pb 0.74 ± 0.02 %	As 0.0213 ± 0.0008 %	Sb 0.033 ± 0.001 %
Fe 0.110 ± 0.003 %	Bi 0.0020 ± 0.0002 %	Se 0.00114 ± 0.00005 %

BAM 223 — Copper-alloy CuZn39Pb2 — 100 g

Year of issue: 1974

Certified values

Cu 58.74 ± 0.02 %	Ni 0.0214 ± 0.0005 %	P 0.0003 ± 0.00015 %
Sn 0.089 ± 0.004 %	Mn (< 0.001) %	S 0.0011 ± 0.0001 %
Zn 38.82 ± 0.09 %	Al (< 0.002) %	Sb 0.0040 ± 0.0002 %
Pb 2.13 ± 0.02 %	As 0.0084 ± 0.0005 %	Se (< 0.0001) %
Fe 0.091 ± 0.002 %	Bi 0.0018 ± 0.0001 %	Si (< 0.003) %

(Values in parenthesis are indicative values)

BAM 224 — Copper-alloy CuZn40MnPb — 100 g

Year of issue: 1975

Certified values

Cu 57.40 ± 0.02 %	Ni 0.038 ± 0.001 %	P 0.0112 ± 0.0002 %
Sn 0.066 ± 0.003 %	Mn 1.70 ± 0.03 %	S 0.0004 ± 0.0001 %
Zn 39.40 ± 0.04 %	Al 0.0012 ± 0.0002 %	Sb 0.0026 ± 0.0001 %
Pb 1.13 ± 0.04 %	As 0.0025 ± 0.0002 %	Si (0.002) %
Fe 0.136 ± 0.002 %	Bi 0.0006 ± 0.0001 %	

BAM 227 — Copper-alloy Rg7 — 100 g

Year of issue: 1979

Certified values

Cu 85.57 ± 0.03 %	Ni 0.284 ± 0.003 %	S 0.122 ± 0.005 %
Sn 6.01 ± 0.07 %	Al (< 0.0001) %	Sb 0.160 ± 0.002 %
Zn 3.46 ± 0.03 %	As 0.081 ± 0.002 %	Se 0.0028 ± 0.0002 %
Pb 4.12 ± 0.04 %	Bi 0.0088 ± 0.0002 %	Si (< 0.01) %
Fe 0.129 ± 0.002 %	P (0.0002) %	Te 0.0012 ± 0.0003 %

(Values in parenthesis are indicative values)

Non ferrous metals and alloys

Code	Product	Unit
BAM 228	Copper-alloy Rg10 Year of issue: 1979 Certified values Cu ..... 85.34 ± 0.03 % Sn ..... 9.76 ± 0.05 % Zn ..... 3.32 ± 0.05 % Pb ..... 1.24 ± 0.03 % Fe ..... 0.036 ± 0.002 % Ni ..... 0.109 ± 0.005 % Mn ..... (< 0.001) % Al ..... (0.0001) % As ..... 0.024 ± 0.001 % Bi ..... 0.0086 ± 0.0003 % P ..... 0.019 ± 0.001 % S ..... 0.036 ± 0.002 % Sb ..... 0.078 ± 0.001 % Se ..... 0.0012 ± 0.0001 % (Values in parenthesis are indicative values)	100 g
BCR-017A	Copper - Sulphur and phosphorous 42 mm diameter x 30 mm disc Certified values P ..... 6.85 mg/kg S ..... 10.4 mg/kg	370 g
BCR-017B	Copper - Sulphur and phosphorous Chips (bottle with 50 g)	50 g

Oxygen in copper

BAM-379/1	Oxygen in copper - disc (40 mm x 30 mm) Certified value O ..... 38 ± 4 µg/g	disc
BAM-379/2	Oxygen in copper - disc (40 mm x 30 mm) Certified value O ..... 212 ± 8 µg/g	disc
BAM-379/3	Oxygen in copper - disc (40 mm x 30 mm) Certified value O ..... 378 ± 12 µg/g	disc
BAM-379/1-3	Oxygen in copper - disc (40 mm x 30 mm) Set of BAM-379/1, BAM-379/2 and BAM-379/3 Certified values BAM-379/1 O ..... 38 ± 4 µg/g BAM-379/2 O ..... 212 ± 8 µg/g BAM-379/3 O ..... 378 ± 12 µg/g	set of discs
BCR-022A	Copper (electrolytic tough pitch) - Oxygen 26 mm diameter x 9 mm disc Certified value O ..... 138 mg/kg	42 g
BCR-022B	Copper (electrolytic tough pitch) - Oxygen 9 mmm diameter x 50 mm rods	28 g
BCR-054R	Copper - Oxygen 7 mm diameter x 50 mm rod Certified value O ..... 0.47 mg/kg	42 g
BCR-058	Copper (continuous cast) - Oxygen 7 mm diameter x 50 mm rods Certified value O ..... 390 mg/kg	17 g
BCR-074A	Electrolytic copper - Trace elements Cylinder of 40 mm diameter and 30 mm height Certified values Ag ..... 12.8 mg/kg As ..... 0.78 mg/kg Cd ..... <0.02 mg/kg Co ..... <0.05 mg/kg Cr ..... <0.1 mg/kg Fe ..... 1.14 mg/kg Mn ..... 1.27 mg/kg Ni ..... 1.04 mg/kg Pb ..... 0.97 mg/kg Sb ..... 0.576 mg/kg Se ..... 0.37 mg/kg Sn ..... <0.07 mg/kg Zn ..... 0.46 mg/kg Indicative values for Bi, Te	disc
BCR-074C	Electrolytic copper - Trace elements Small pieces (approx. 4 mm x 4 mm x 2 mm) in a bottle containing about 50 g	50 g

Code	Product	Unit

BCR-691 — Copper alloys - Alloying elements — Set (5)

Set of five discs (one of each composition) of 35 diameter and 2 mm thickness

Certified values

Substance	Quaternary bronze	Brass	Arsenic-Copper	Lead-bronze	Tin-bronze
As	1.94 g/kg	0.99 g/kg	46.0 g/kg	2.85 g/kg	1.94 g/kg
Pb	79 g/kg	3.9 g/kg	1.75 g/kg	92 g/kg	2.04 g/kg
Sn	71.6 g/kg	20.6 g/kg	2.02 g/kg	101 g/kg	70 g/kg
Zn	60.2 g/kg	148 g/kg	0.55 g/kg	1.48 g/kg	1.57 g/kg

Unalloyed zinc

BAM-M601 — Pure zinc- disc (45 mm x 30 mm) — disc

Year of issue:2005

Certified values

Cd 0.55 ± 0.06 µg/g	Tl 2.25 ± 0.09 µg/g	In < 0.05 µg/g
Fe 2.20 ± 0.09 µg/g	Pb 15.7 ± 0.3 µg/g	
Cu 1.89 ± 0.11 µg/g	Al < 0.5 µg/g	

(Values in parenthesis are indicative values)

BCR-321 — Unalloyed zinc - Trace elements — 0.7 kg

Disc of 80 mm diameter and 20 mm thickness

Certified values

Al <0.7 mg/kg	Pb 4.85 mg/kg	Tl 0.78 mg/kg
In <0.2 mg/kg	Sn <0.5 mg/kg	

Indicative values for Cd, Cu, Fe

ERM-EB322 — Unalloyed zinc - Trace elements — 0.7 kg

Disc of 60 mm diameter and 30 mm thickness

Certified values

Cd 15.08 mg/kg	Fe 19.1 mg/kg	Sn 5.6 mg/kg
Cu 5.89 mg/kg	Pb 15.0 mg/kg	Tl 5.28 mg/kg

ERM-EB323 — Unalloyed zinc - Trace elements — 0.7 kg

Disc of 60 mm diameter and 30 mm thickness

Certified values

Cd 6.51 mg/kg	Fe 11.3 mg/kg	Sn 18.7 mg/kg
Cu 18.9 mg/kg	Pb 48.6 mg/kg	Tl 10.8 mg/kg

ERM-EB324 — Unalloyed zinc - Trace elements — 0.7 kg

Disc of 60 mm diameter and 30 mm thickness

Certified values

Cd 48.6 mg/kg	Fe 58.5 mg/kg	Sn 9.8 mg/kg
Cu 9.87 mg/kg	Pb 26.1 mg/kg	Tl 19.9 mg/kg

ERM-EB325 — Unalloyed zinc - Trace elements — 0.7 kg

Disc of 60 mm diameter and 30 mm thickness

Certified values

Cd 94.7 mg/kg	Fe 56.1 mg/kg	Sn 46.1 mg/kg
Cu 47.5 mg/kg	Pb 142 mg/kg	Tl 36.8 mg/kg

BCR-326 — Unalloyed zinc - Trace elements — 0.7 kg

Discs of 80 mm diameter and 20 mm thickness

Certified values

Cd 203.0 mg/kg	Fe 264.8 mg/kg
Cu 104.8 mg/kg	Pb 307.0 mg/kg

Indicative value for Al

BCR-327 — Unalloyed zinc - Trace elements — 0.7 kg

Disc of 80 mm diameter and 20 mm thickness

Certified values

Cd 301.4 mg/kg	Fe 144.0 mg/kg	Pb 409.4 mg/kg

Indicative value for Cu

Zinc alloys

BCR-351 — Zinc alloy ZnAl4 - Trace elements — 0.7 kg

Disc of 80 mm diameter and 20 mm thickness

Certified values

Al 43.55 x 10^3 mg/kg	Mg 131.0 mg/kg	Tl 0.74 mg/kg
Cu 12.13 mg/kg	Pb 4.50 mg/kg	
In <0.2 mg/kg	Sn <1 mg/kg	

Indicative values for Cd, Ni

Code	Product	Unit
BCR-352	Zinc alloy ZnAl4 - Trace elements Disc of 80 mm diameter and 20 mm thickness Certified values Al 41.50 x 10^3 mg/kg, Cd 2.88 mg/kg, Cu 31.26 mg/kg, In 3.02 mg/kg, Mg 283.0 mg/kg, Ni 6.74 mg/kg, Sn 3.0 mg/kg, Tl 3.2 mg/kg Indicative value for Pb	0.7 kg
BCR-353	Zinc alloy ZnAl4 - Trace elements Disc of 80 mm diameter and 20 mm thickness Certified values Al 39.5 x 10^3 mg/kg, Cd 10.44 mg/kg, Cu 100.0 mg/kg, In 2.55 mg/kg, Mg 452.5 mg/kg, Pb 24.4 mg/kg, Sn 5.6 mg/kg, Tl 3.95 mg/kg	0.7 kg
BCR-354	Zinc alloy ZnAl4 - Trace elements Disc of 80 mm diameter and 20 mm thickness Certified values Al 37.27 x 10^3 mg/kg, Cd 29.7 mg/kg, Cu 312.3 mg/kg, In 9.8 mg/kg, Mg 602 mg/kg, Ni 83.1 mg/kg, Pb 30.8 mg/kg, Sn 14.1 mg/kg, Tl 11.01 mg/kg	0.7 kg
BCR-355	Zinc alloy ZnAl4 - Trace elements Disc of 80 mm diameter and 20 mm thickness Certified values Al 34.43 x 10^3 mg/kg, Cd 58.1 mg/kg, Cu 1035 mg/kg, In 24.6 mg/kg, Mg 786 mg/kg, Ni 268 mg/kg, Pb 56.9 mg/kg, Sn 29.1 mg/kg, Tl 23.25 mg/kg	0.7 kg
BCR-356	Zinc alloy ZnAl4Cu1 - Trace elements Disc of 80 mm diameter and 20 mm thickness Certified values Al 44.34 x 10^3 mg/kg, Cd 0.73 mg/kg, Cu 3.944 x 10^3 mg/kg, Fe 31.5 mg/kg, In <0.2 mg/kg, Mg 132.3 mg/kg, Ni 3.43 mg/kg, Pb 9.87 mg/kg, Tl 0.79 mg/kg Indicative value for Sn	0.7 kg
BCR-357	Zinc alloy ZnAl4Cu1 - Trace elements Disc of 80 mm diameter and 20 mm thickness Certified values Al 42.27 x 10^3 mg/kg, Cd 2.83 mg/kg, Cu 5.849 x 10^3 mg/kg, Fe 25.7 mg/kg, In 3.30 mg/kg, Mg 273 mg/kg, Ni 9.82 mg/kg, Pb 13.8 mg/kg, Sn 3.51 mg/kg, Tl 2.76 mg/kg	0.7 kg
BCR-359	Zinc alloy ZnAl4Cu1 - Trace elements Disc of 80 mm diameter and 20 mm thickness Certified values Al 37.11 x 10^3 mg/kg, Cd 29.8 mg/kg, Cu 9.89 x 10^3 mg/kg, Fe 119.7 mg/kg, In 15.5 mg/kg, Mg 557 mg/kg, Ni 92.6 mg/kg, Pb 36.2 mg/kg, Sn 16.93 mg/kg, Tl 13.34 mg/kg	0.7 kg
BCR-360	Zinc alloy ZnAl4Cu1 - Trace elements Disc of 80 mm diameter and 20 mm thickness Certified values Al 34.27 x 10^3 mg/kg, Cd 59.5 mg/kg, Cu 12.34 x 10^3 mg/kg, In 29.8 mg/kg, Mg 705 mg/kg, Ni 267 mg/kg, Pb 73.9 mg/kg, Sn 33.0 mg/kg, Tl 25.9 mg/kg	0.7 kg
BCR-361	Zinc alloy ZnAl4Cu1 - Trace elements Disc of 80 mm diameter and 20 mm thickness Certified values Al 40.68 x 10^3 mg/kg, Cu 7.98 x 10^3 mg/kg, Fe 10.34 mg/kg, Pb 5.31 mg/kg, Sn 46.3 mg/kg, Tl 37.4 mg/kg Indicativ values for Cd, In	0.7 kg

Code	Product	Unit

Lead base standards

BNM 010 — Tin-lead solder - granulated powder — 100 g

Year of issue: 1991

Certified values

Sn ..... 63.40 ± 0.07 %	Ni ..... 0.0021 ± 0.0002 %	Fe ..... (0.0020) %
Pb ..... 36.47 ± 0.17 %	Sb ..... 0.0488 ± 0.0008 %	In ..... (< 0.001) %
Bi ..... 0.0245 ± 0.0010 %	Ag ..... (0.014) %	Zn ..... (< 0.0001) %
Cd ..... 0.0016 ± 0.0002 %	As ..... (0.012) %	
Cu ..... 0.0417 ± 0.0014 %	Au ..... (< 0.001) %	

(Values in parenthesis are indicative values)

ERM-EB101 — Lead alloy PbCaSnAl - disc (50 mm x 30 mm) (BAM-101) — disc

Year of issue: 1999

Certified values

Ca ..... 0.1436 ± 0.0016 %	Al ..... 0.0257 ± 0.0006 %	Bi ..... 0.0165 ± 0.0007 %
Sn ..... 0.293 ± 0.007 %	Ag ..... 0.00288 ± 0.00007 %	Cu ..... 0.00173 ± 0.00018 %

ERM-EB102 — Lead alloy PbCaSn - disc (50 mm x 30 mm) (BAM-102) — disc

Year of issue: 1999

Certified values

Ca ..... 0.0705 ± 0.0011 %	Al ..... 0.0124 ± 0.0004 %	Bi ..... 0.0148 ± 0.0005 %
Sn ..... 0.895 ± 0.011 %	Ag ..... 0.00248 ± 0.00007 %	Cu ..... 0.00109 ± 0.00007 %

ERM-EB103 — Lead-alloy, PbSb1,6 - disc (50 mm x 30 mm) (BAM-103) — disc

Year of issue: 2006

Certified values

Sn ..... 0.183 ± 0.026 %*	As ..... 0.097 ± 0.004 %*	Ni ..... 3.02 ± 0.27 mg/kg*
Bi ..... 0.0158 ± 0.0004 %*	Se ..... 0.0180 ± 0.0010 %*	Cd ..... 0.20 ± 0.08 mg/kg*
Cu ..... 9.7 ± 0.9 mg/kg*	Ag ..... 0.0066 ± 0.0006 %*	S ..... (5.4 ± 1.2 mg/kg*)
Sb ..... 1.64 ± 0.06 %*	Tl ..... 15.2 ± 0.7 mg/kg*	Te ..... (1.9 ± 0.6 mg/kg*)

(Values in parenthesis are indicative values)

BCR-286A — Lead (electrolytically refined) - Trace elements — 600 g

Block of 60 mm x 60 mm x 12 mm

Certified values

Bi ..... 21.5 mg/kg	Tl ..... 2.47 mg/kg
Sb ..... 0.099 mg/kg	Zn ..... <0.1 mg/kg

BCR-286B — Lead (electrolytically refined) - Trace elements — 160 g

Chips in bottles containing about 160 g

BCR-287A — Lead (thermally refined) -Trace elements — 600 g

Block of 60 mm x 60 mm x 12 mm

Certified values

Ag ..... 15.2 mg/kg	Cu ..... 0.98 mg/kg	Tl ..... 0.73 mg/kg
Bi ..... 67.3 mg/kg	Sb ..... 0.040 mg/kg	Zn ..... <0.1 mg/kg
Cd ..... 0.356 mg/kg	Sn ..... <0.05 mg/kg	

BCR-287B — Lead (thermally refined) -Trace elements — 160 g

Chips in bottles containing about 160 g

BCR-288A — Lead with added impurities - Trace elements — 600 g

Block of 60 mm x 60 mm x 12 mm

Certified values

As ..... 55.7 mg/kg	Cu ..... 19.3 mg/kg	Tl ..... 2.26 mg/kg
Bi ..... 215.8 mg/kg	Se ..... <0.2 mg/kg	Zn ..... 8.2 mg/kg
Cd ..... 33.3 mg/kg	Te ..... 32.8 mg/kg	

BCR-288B — Lead with added impurities - Trace elements — 160 g

Chips in bottles containing about 160 g

BCR-055 — Lead (refined) - Oxygen — 71 g

Disc of 30 mm diameter x 9 mm thickness

Certified value

O ..... 1.0 mg/kg

Gold base standards

BAM-501 — Potassium Dicyanoaurate (I) — 6 g

Year of issue: 1997

Certified value

Au ..... 682.23 ± 0.25 g/kg

Code	Product	Unit

Nickel base standards

BCR-099 — Nickel - Oxygen and nitrogen — 50 g
25 cubes of nominally 2 g each
Certified values
O ..... 8.4 mg/kg N .....1.1 mg/kg

Titanium base standards

BCR-059A — Titanium alloy Ti6Al4V - Oxygen and nitrogen — 21 g
26 mm diameter x 9 mm discs
Certified values
O ..... 1750 mg/kg N .....172 mg/kg

BCR-059B — Titanium alloy Ti6Al4V - Oxygen and nitrogen — 5 g
25 cubes of 0.2 g

BCR-089 — Titanium alloy Ti 6Al 4V - Aluminium, Vanadium — disc
Cylinder of 40 mm diameter and 20 mm height
Certified values
Al..... 59.7 g/kg V ..... 39.76 g/kg

BCR-090A — Titanium - Impurities — disc
Cylinder of 40 mm diameter and 20 mm height
Certified values

B..... 28.2 x 10^{-3} g/kg	Cu.....0.513 g/kg	Mo ..... 0.488 g/kg
Co ..... 0.501 g/kg	Fe ..... 0.563 g/kg	Ni..... 0.667 g/kg
Cr ..... 0.533 g/kg	Mn..... 0.314 g/kg	

Indivativ values for Nb, Sn, W, Zr

BCR-090B — Titanium - Impurities — 25 g
Cubes of about 0.2 g

BCR-024B — Titanium - Oxygen and nitrogen — 10 g
25 cubes of 0.4 g
Certified values
N ..... 117 mg/kg O.....608 mg/kg

BCR-024C — Titanium - Oxygen, nitrogen — 5 g
25 cubes of 0.2 g

BCR-318 — Titanium - Hydrogen — 20 g
7 mm diameter x 1 mm discs (approx. 100 discs of at least 0.2 g each)
Certified value
H ..... 12.2 mg/kg

Zirconium base standards

BCR-275 — Zirconium alloy Zircaloy-4 - Oxygen, nitrogen and carbon — 9 g
10 discs each 13 mm diameter x 1 mm
Certified values
O ..... 1670 mg/kg N .....39.0 mg/kg C ..... 113 mg/kg

BCR-276 — Zirconium alloy Zircaloy-4 - Oxygen, nitrogen and carbon — 20 g
4.5 mm diameter x 2 mm (approx. 100 cylinders)
Certified values
O ..... 1540 mg/kg N .....41.0 mg/kg C ..... 108 mg/kg

Tungsten base standards

BCR-102 — Tungsten carbide powder - Oxygen — 2-3 g
Powder sealed under argon
Certified value
O ..... 185 mg/kg

Bauxite and Fluorspar

Code	Product	Unit
BCS CRM395	Bauxite	100 g

Certified values %

Fe_2O_3 ..... 16.3 %	Na_2O ..... (0.02) %	Pb ..... (0.0028) %
SiO_2 ..... 1.24 %	K_2O ..... (0.02) %	Sr ..... (0.0023) %
Al_2O_3 ..... 52.4 %	Cr ..... (0.0453) %	Zn ..... (0.0043) %
TiO_2 ..... 1.93 %	Cu ..... (0.0021) %	L.O.I. ..... 27.8 %
CaO ..... 0.05 %	Mn ..... (0.0042) %	
MgO ..... 0.02 %	Ni ..... (0.0034) %	

(Values in parenthesis are indicative values)

NIST-69B	Bauxite, Arkansas - Constituents	60 g

Certified values

Al_2O_3 ..... 48.8 %	MgO ..... 0.085 %	TiO_2 ..... 1.90 %
CaO ..... 0.13 %	MnO ..... 0.110 %	V_2O_5 ..... 0.028 %
Cr_2O_3 ..... 0.011 %	P_2O_5 ..... 0.118 %	ZnO ..... 0.0035 %
Fe_2O_3 ..... 7.14 %	SO_3 ..... 0.551 %	ZrO_2 ..... 0.29 %
K_2O ..... 0.068 %	SiO_2 ..... 13.43 %	LOI* ..... 27.2 %

Indicative values for Co, BaO, Na_2O

LOI* Loss on Ignition

NIST-600	Bauxite, Australian - Constituents	90 g

Certified values

Al_2O_3 ..... 40.0 %	MnO ..... 0.013 %	V_2O_5 ..... 0.060 %
CaO ..... 0.22 %	Na_2O ..... 0.022 %	ZnO ..... 0.003 %
Cr_2O_3 ..... 0.024 %	P_2O_5 ..... 0.039 %	ZrO_2 ..... 0.060 %
Fe_2O_3 ..... 17.0 %	SO_3 ..... 0.155 %	LOI* ..... 20.5 %
K_2O ..... 0.23 %	SiO_2 ..... 20.3 %	
MgO 0.055	TiO_2 ..... 1.31 %	

LOI* Loss on Ignition

NIST-696	Bauxite, Surinam - Constituents	60 g

Certified value

Al_2O_3 ..... 54.5 %	MgO ..... 0.012 %	TiO_2 ..... 2.64 %
CaO ..... 0.018 %	MnO ..... 0.004 %	V_2O_5 ..... 0.072 %
Cr_2O_3 ..... 0.047 %	P_2O_5 ..... 0.050 %	ZnO ..... 0.0014 %
Fe_2O_3 ..... 8.70 %	SiO_2 ..... 3.79 %	ZrO_2 ..... 0.14 %
K_2O ..... 0.009 %	SO_3 ..... 0.15 %	LOI* ..... 29.9 %

Indicative values for Co, BaO, Na_2O

LOI* Loss on Ignition

NIST-697	Bauxite, Dominican - Constituents	60 g

Certified value

Al_2O_3 ..... 45.8 %	MgO ..... 0.18 %	TiO_2 ..... 2.52 %
CaO ..... 0.71 %	MnO ..... 0.41 %	V_2O_5 ..... 0.063 %
Cr_2O_3 ..... 0.100 %	P_2O_5 ..... 0.97 %	ZnO ..... 0.037 %
Fe_2O_3 ..... 20.0 %	SiO_2 ..... 6.81 %	ZrO_2 ..... 0.065 %
K_2O ..... 0.062 %	SO_3 ..... 0.077 %	LOI* ..... 22.1 %

Indicative values for Co, BaO, Na_2O

LOI* Loss on Ignition

NIST-698	Bauxite, Jamaican - Constituents	60 g

Certified value

Al_2O_3 ..... 48.2 %	MgO ..... 0.058 %	TiO_2 ..... 2.38 %
CaO ..... 0.62 %	MnO ..... 0.38 %	V_2O_5 ..... 0.064 %
Cr_2O_3 ..... 0.080 %	P_2O_5 ..... 0.37 %	ZnO ..... 0.029 %
Fe_2O_3 ..... 0.013 %	SiO_2 ..... 0.69 %	ZrO_2 ..... 0.0,061 %
K_2O ..... 0.010 %	SO_3 ..... 0.143 %	LOI* ..... 27.3 %

Indicative values for Co, BaO, Na_2O

LOI* Loss on Ignition

BCS CRM392	Fluorspar	100 g

Certified values

SiO_2 ..... 0.67 %	BaO ..... 0.37 %	Pb ..... 0,18 %
CaF_2 ..... 97.2 %	S ..... 0.12 %	
CaO ..... 0.52 %	CO_2 ..... 0.48 %	

NIST-79A	Fluorspar, customs grade - Calcium fluoride	120 g

Certified value

CaF_2 ..... 297.39 %

NIST-180	Fluorspar, high grade - Calcium fluoride	120 g

Certified value

CaF_2 ..... 98.80%

Ores

Code	Product	Unit
BCS CRM308	Grecian chrome ore Certified values FeO 15.3 %, SiO_2 4.25 %, Al_2O_3 19.4 %, Cr_2O_3 41.5 %, TiO2 (0.16) %, CaO 0.34 %, MgO 16.4 %, MnO (0.14) %, Na_2O (0.04) %, K_2O (0.01) %, L.O.I. (0.9) % (Values in parenthesis are indicative values)	100 g
BCR-010	Tin ore powder - Tin Certified value Sn 765.9 g/kg	225 g
BCS CRM355	Tin ore Certified values Sn 31.42 %, Fe 17.08 %, Cu 0.085 %, As 0.14 %, Bi 0.015 %, Zn 0.059 %, Pb 0.012 %, S 0.5 %, W 0.35 %, Ni 0.004 %, Si 7.14 %, Ti 0.37 %, Al 4.12 %, Ca 2.63 %, F 2.07 %	100 g
BCR-109	Zinc ore concentrate - Trace elements Certified values Cd 4.61 g/kg, Cu 9.46 g/kg, F 0.081 g/kg, Fe 145.1 g/kg, Hg 0.00096 g/kg, Mg 0.20 g/kg, Pb 7.38 g/kg	200 g
BCR-110	Zinc ore concentrate - Trace elements Certified values Cd 10.51 g/kg, Cu 16.28 g/kg, F 0.055 g/kg, Fe 5.46 g/kg, Hg 0.1484 g/kg, Mg 1.36 g/kg, Pb 97.8 g/kg	200 g
NIST-181	Lithium ore, Spodumene - Lithium oxide Certified value Li_2O 6.39 %	45 g
NIST-182	Lithium ore, Petalite - Lithium oxide Certified value Li_2O 4.34 %	45 g
NIST-183	Lithium ore, Lepidolite - Lithium oxide Certified value Li_2O 4.12 %	45 g
NIST-330	Copper ore mill heads - Copper, molybdenum and rhenium Certified values Cu 0.84 %, Mo 0.018 %, Re 0.30 mg/kg Indicative values for Ag, Au	100 g
NIST-25D	Manganese ore - Constituents Certified values Mn 51.78 %, Al_2O_3 5.32 %, Fe_2O_3 3.92 %, K_2O 0.93 %, P_2O_5 0.25 %, SiO_2 2.52 %, TiO_2 0.13 %, Available oxygen 14.28 % Indicative values for BaO, CaO, Moisture	100 g
BCS CRM176/2	Manganese ore Certified values Fe 6.86 %, SiO_2 2.53 %, Al_2O_3 5.2 %, TiO_2 0.3 %, CaO 0.09 %, MgO 0.04 %, S 0.018 %, P 0.087 %, Mn 47.5 %, Na_2O 0.11 %, K_2O 1.3 %, BaO 0.19 %, Pb 0.01 %, As_2O_3 0.22 %	100 g
NCS DC47004	Manganese ore - Constituents Certified values Cu 0.013 %, Fe 1.22 %, Mn 45.39 %, Ni 0.019 %, P 0.054 %, S 0.007 %, Zn 0.027 %, Al_2O_3 2.20 %, BaO 0.68 %, CaO 1.06 %, K_2O 1.00 %, MgO 0.64 %, MnO_2 67.25 %, Na_2O 0.044 %, SiO_2 16.16 %, TiO_2 0.063 % Indicative value for $Mn(SiO_3^{2-})$	100 g

Code	Product	Unit
NCS DC47005	Manganese ore - Constituents Certified values Cu 0.014 %, Fe 2.24 %, Mn 36.99 %, Ni 0.019 %, P 0.081 %, S 0.013 %, Zn 0.029 %, Al_2O_3 3.00 %, BaO 0.47 %, CaO 3.60 %, K_2O 0.46 %, MgO 1.44 %, MnO_2 54.38 %, Na_2O 0.048 %, SiO_2 22.24 %, TiO_2 0.10 % Indicative value for $Mn(SiO_3^{2-})$	100 g
NCS DC47006	Manganese ore - Constituents Certified values Cu 0.036 %, Fe 11.24 %, Mn 32.54 %, Ni 0.099 %, P 0.207 %, S 0.019 %, Zn 0.064 %, Al_2O_3 8.55 %, BaO 0.18 %, CaO 0.083 %, K_2O 0.93 %, MgO 0.11 %, MnO_2 48.01 %, Na_2O 0.039 %, SiO_2 14.50 %, TiO_2 0.43 % Indicative value for $Mn(SiO_3^{2-})$	100 g
NCS DC47007	Manganese ore - Constituents Certified values Cu 0.028 %, Fe 20.99 %, Mn 25.00 %, Ni 0.073 %, P 0.275 %, S 0.032 %, Zn 0.048 %, Al_2O_3 8.97 %, BaO 0.23 %, CaO 0.051 %, K_2O 0.72 %, MgO 0.10 %, MnO_2 36.93 %, Na_2O 0.030 %, SiO_2 10.46 %, TiO_2 0.54 % Indicative value for $Mn(SiO_3^{2-})$	100 g
NCS DC47008	Manganese ore - Constituents Certified values Cu 0.009 %, Fe 1.40 %, Mn 22.54 %, Ni 0.041 %, P 0.043 %, S 0.21 %, Zn 0.018 %, Al_2O_3 1.68 %, BaO 0.13 %, CaO 14.73 %, K_2O 0.46 %, MgO 3.50 %, $Mn(CO_3^{2-})$ 22.46 %, Na_2O 0.024 %, SiO_2 14.07 %, TiO_2 0.10 % Indicative value for $Mn(SiO_3^{2-})$	100 g
NCS DC47009	Manganese ore - Constituents Certified values Cu 0.01 %, Fe 2.07 %, Mn 15.74 %, Ni 0.050 %, P 0.061 %, S 0.27 %, Zn 0.020 %, Al_2O_3 2.49 %, BaO 0.15 %, CaO 19.78 %, K_2O 0.70 %, MgO 3.82 %, $Mn(CO_3^{2-})$ 15.69 %, Na_2O 0.040 %, SiO_2 15.82 %, TiO_2 0.15 % Indicative value for $Mn(SiO_3^{2-})$	100 g
NIST-RM 8602	Chinese lead ore - Elements and constituents This Reference Material (RM) is a lead ore mined from a skarn lead-zinc-copper deposit, then prepared and certified by the Hubei Geological Research Laboratory (HGRL) in China which is the sole authority for the information provided with this material including reference values and other technical information. It is intended for use in geological and geochemical investigations, particularly in geochemical exploration programs and in studies of ore genesis, and for environmental monitoring in mining areas. Each unit of this RM consists of 100 g of ore pulverized to pass a 100 µm screen (-160 mesh). Reference values for selected elements and gangue constituents are given.	100 g
NIST-RM 8603	Chinese lead ore - Elements and constituents This Reference Material (RM) is a lead ore mined from a skarn lead-zinc-copper deposit, then prepared and certified by the Hubei Geological Research Laboratory (HGRL) in China which is the sole authority for the information provided with this material including reference values and other technical information. It is intended for use in geological and geochemical investigations, particularly in geochemical exploration programs and in studies of ore genesis, and for environmental monitoring in mining areas. Each unit of this RM consists of 100 g of ore pulverized to pass a 100 µm screen (-160 mesh). Reference values for selected elements and gangue constituents are given.	100 g
NIST-277	Tungsten concentrate - Tungsten oxide Certified value WO_3 67.4 % Indicative values for Ca, Fe, Mn, Mo, Nb, O, P, Pb, S, Si, Sn, Ta, Ti	100 g
NIST-RM 8607	Chinese tungsten ore - Elements and constituents This Reference Material (RM) is a tungsten ore mined from a greisen tungsten-tin-bismuth deposit, then prepared and certified by the Hubei Geological Research Laboratory (HGRL) in China which is the sole authority for the information provided with this material including reference values and other technical information. It is intended for use in geological and geochemical investigations, particularly in geochemical exploration programs and in studies of ore genesis, and for environmental monitoring in mining areas. Each unit of this RM consists of 100 g of ore pulverized to pass a 100 µm screen (-160 mesh). Reference values for selected elements and gangue constituents are given.	100 g

Code	Product	Unit
NIST-RM 8608	Chinese tungsten ore - Elements and constituents This Reference Material (RM) is a molybdenum ore mined from a skarn molybdenum deposit, then prepared and certified by the Hubei Geological Research Laboratory (HGRL) in China which is the sole authority for the information provided with this material including reference values and other technical information. It is intended for use in geological and geochemical investigations, particularly in geochemical exploration programs and in studies of ore genesis, and for environmental monitoring in mining areas. Each unit of this RM consists of 100 g of ore pulverized to pass a 100 µm screen (-160 mesh). Reference values for selected elements and gangue constituents are given	100 g
NCS DC70008	Tungsten ore - Constituents Certified values for 38 elements, 9 oxides Indicative values for 5 elements	100 g
NIST-886	Gold ore, refractory - Trace elements Certified values S.....1.466 % Al_2O_3.....8.25 mg/kg Indicative values for C (total), SO_3	200 g
NIST-1835	Borate ore - Constituents Certified values F.....0.348 % Fe_2O_3..... 1.141 % Na_2O .....3.484 % Al_2O_3 .....3.474 % MgO..... 3.411 % SO_3 .....1.477 % B_2O_3 .....18.739 % MnO..... 0.0333 % SrO.....0.9418 % BaO.....0.0497 % K_2O..... 1.261 % TiO_2.....0.1332 % CaO.....21.622 % SiO_2 ..... 18.408 % LOI*.....25.72 %	60 g

Refractories and carbides

Code	Product	Unit
BAM-S002	Tungsten metal powder Certified values Al..... 29.4 ± 0.9 mg/kg Fe .....53 ± 5 mg/kg Na ..... 41 ± 5 mg/kg Ca ..... 46 ± 4 mg/kg K .....40.0 ± 1.8 mg/kg Ni..... 29 ± 4 mg/kg Co ..... 45 ± 6 mg/kg Mg.....38.8 ± 2.7 mg/kg P.....(7.2 ± 1.3) mg/kg Cr ..... 47.0 ± 1.4 mg/kg Mn.....16.7 ± 1.9 mg/kg Si..... 106 ± 10 mg/kg Cu ..... 28.4 ± 2.9 mg/kg Mo.....59 ± 4 mg/kg Sn..... 42 ± 6 mg/kg (Values in parenthesis are indicative values)	100 g
NIST-76A	Burnt refractory (Al_2O_3-40%) - Constituents Certified values Al_2O_3 .....38.7 % Li_2O..... 0.042 % SiO_2.....54.9 % CaO.....0.22 % MgO..... 0.52 % SrO.....0.037 % Fe_2O_3 .....1.60 % Na_2O..... 0.07 % % TiO_2.....2.03 % K_2O .....1.33 % P_2O_5..... 0.120 % Indicative value for LOI* * Loss on Ignition	75 g
NIST-77A	Burnt refractory (Al_2O_3 - 60%) - Constituents Certified values Al_2O_3 .....60.2 % Li_2O..... 0.025 % SiO_2.....35.0 % CaO.....0.05 % MgO..... 0.38 % SrO.....0.009 % Fe_2O_3 .....1.00 % Na_2O..... 0.037 % TiO_2.....2.66 % K_2O .....0.090 % P_2O_5..... 0.092 % Indicative value for LOI* * Loss on Ignition	75 g
NIST-78A	Burnt refractory (Al_2O_3- 70%) - Constituents Certified values Al_2O_3 .....71.7 % Li_2O..... 0.12 % SiO_2.....19.4 % CaO.....0.11 % MgO..... 0.70 % SrO.....0.25 % Fe_2O_3 .....1.2 % Na_2O..... 0.078 % TiO_2.....3.22 % K_2O .....1.22 % P_2O_5..... 1.3 % Indicative value for LOI* * Loss on Ignition	75 g
NIST-198	Silica brick - Constituents Certified values Al_2O_3 .....0.16 % Li_2O..... 0.001 % P_2O_5 .....0.022 % CaO.....2.71 % MgO..... 0.07 % TiO_2.....0.02 % Fe_2O_3 .....0.66 % MnO..... 0.008 % LOI*.....0.21 % K_2O .....0.017 % Na_2O..... 0.012 % * Loss on Ignition	45 g

Code	Product	Unit
NIST-199	Silica brick - Constituents	45 g

Certified values

Al_2O_3 .... 0.48 %
CaO .... 2.41 %
Fe_2O_3 .... 0.74 %
K_2O .... 0.094 %
Li_2O .... 0.002 %
Na_2O .... 0.015 %
MgO .... 0.13 %
MnO .... 0.007 %
P_2O_5 .... 0.015 %
TiO_2 .... 0.06 %
LOI* .... 0.17 %

* Loss on Ignition

Code	Product	Unit
NIST-887	Cemented carbide (W83-Co25-Ti4) - Cobalt	100 g

Certified value

Co .... 10.35 %

Indicative value for C

Code	Product	Unit
NIST-888	Cemented carbide (W64-Co25-Ti4) - Cobalt and tantalum	100 g

Certified values

Co .... 24.7 %
Ta .... 4.77 %

Indicative value for C

Code	Product	Unit
NIST-889	CEM carbide (W75-Co9-Ta5-Ti4) - Cobalt, tantalum and titanium	100 g

Certified values

Co 9.50
Ta 4.60
Ti 4.03

Indicative value for C

Code	Product	Unit
NIST-889	CEM carbide (W75-Co9-Ta5-Ti4) - Cobalt, tantalum and titanium	100 g

Certified values

Co 9.50
Ta 4.60
Ti 4.03

Indicative value for C

Code	Product	Unit
NIST-889	CEM carbide (W75-Co9-Ta5-Ti4) - Cobalt, tantalum and titanium	100 g

Certified values

Co 9.50
Ta 4.60
Ti 4.03

Indicative value for C

Code	Product	Unit
BCS CRM352/1	Tungsten carbide	100 g

Certified values

C_{Total} .... 6.154 %
C_{Free} .... 0.036 %
Fe .... 0.0029 %
O .... 0.11 %

Code	Product	Unit
NIST-276B	Tungsten carbide - Carbon	75 g

Certified value

C .... 6.10 %

Indicative values for C (free), O, N

Code	Product	Unit
BCS CRM359	Nitrogen bearing silicon carbide	100 g

Certified values

C_{Total} .... 23.46 %
Si_{Total} .... 67.6 %
Al_{Total} .... 0.118 %
C_{Free} .... (0.061) %
Si_{Free} .... (0.325) %
Fe_{Total} .... 0.175 %
Mn .... (<0.01) %
Ni .... (0.014) %
O .... (0.532) %
N .... (7.84) %
Ti .... 0.022 %
V .... (0.027) %
Ca .... 0.108 %
Mg .... (<0.01) %
Na .... (<0.01) %
K .... (<0.01) %

(Values in parenthesis are indicative values)

Code	Product	Unit
BCS CRM360	Sialon bonded silicon carbide	100 g

Certified values

C_{Total} .... 23.53 %
Si_{Total} .... 60.8 %
Al_{Total} .... 6.52 %
C_{Free} .... (0.085) %
Si_{Free} .... (0.538) %
Fe_{Total} .... (0.19) %
Mn .... (<0.01) %
Cr .... (<0.01) %
Ni .... (0.013) %
O .... (4.03) %
N .... (4.77) %
Ti .... 0.025 %
Ca .... 0.115 %
Mg .... (<0.02) %
Na .... (<0.01) %
K .... (<0.01) %

(Values in parenthesis are indicative values)

Code	Product	Unit

Cement

BCS CRM353 — Sulphate resist portland cement — 100 g

Certified values

SiO_2 20.5 %	Mn_2O_3 0.23 %	P_2O_5 0.077 %
Al_2O_3 3.77 %	CaO 64.8 %	SO_3 2.25 %
TiO_2 0.16 %	MgO 2.42 %	SrO 0.23 %
Fe_2O_3 4.82 %	Na_2O (Acid Sol) 0.1 %	Cl (0.01) %
Cr_2O_3 (0.02) %	K_2O (Acid Sol) 0.49 %	

(Values in parenthesis are indicative values)

BCS CRM354 — White Portland Cement — 100 g

Certified values

SiO_2 21.8 %	Mn_2O_3 0.057 %	P_2O_5 0.12 %
Al_2O_3 4.85 %	CaO 70 %	SO_3 2.25 %
TiO_2 0.04 %	MgO 0.42 %	SrO 0.11 %
Fe_2O_3 0.3 %	Na_2O (Acid Sol) 0.1 %	Cl 0.005 %
Cr_2O_3 (0.003 %)	K_2O (Acid Sol) 0.11 %	

(Values in parenthesis are indicative values)

BCS CRM372/1 — Ordinary portland cement — 100 g

Certified values

SiO_2 20.3 %	Mn_2O_3 0.074 %	P_2O_5 (0.07) %
Al_2O_3 5.37 %	CaO 65.3 %	SO_3 2.95 %
TiO_2 0.27 %	MgO 1.31 %	SrO (0.05) %
Fe_2O_3 3.42 %	Na_2O (Acid Sol) 0.1 %	Cl (0.008) %
Cr_2O_3 (0.01) %	K_2O (Acid Sol) 0.75 %	

(Values in parenthesis are indicative values)

Special materials

High tech ceramics

Code	Product	Unit

ERM-ED101 — Silicon nitride powder (BAM-S001) — 50 g

Certified values

Al 469 ± 12 mg/kg	Mg 4.3 ± 0.4 mg/kg	N 38.1 ± 0.2 %
Ca 14.1 ± 0.5 mg/kg	Na 7.59 ± 0.27 mg/kg	O (1.91± 0.07) %
Co 43.5 ± 0.8 mg/kg	W 41.3 ± 1.3 mg/kg	ß-phase 7.43 ± 0.09 %
Fe 79.5 ± 1.3 mg/kg	C 0.162 ± 0.024 %	

(Values in parenthesis are indicative values)

BAM-S003 — Silicon carbide powder — bottle

Certified values

Al 372 ± 20 mg/kg	Mn 1.44 ± 0.17 mg/kg	O 910 ± 35 mg/kg
B 63 ± 7 mg/kg	Na 17.7 ± 0.8 mg/kg	N (93 ± 22) mg/kg
Ca 29.4 ± 1.8 mg/kg	Ni 32.9 ± 2.7 mg/kg	$SiO_{2\ free}$ (600 ± 148) mg/kg
Cr 3.5 ± 0.4 mg/kg	Ti 79 ± 4 mg/kg	Si_{free} (481 ± 223) mg/kg
Cu 1.5 ± 0.4 mg/kg	V 41.4 ± 2.8 mg/kg	C_{total} 29.89 ± 0.07 %
Fe 149 ± 10 mg/kg	Zr 25.2 ± 2.0 mg/kg	
Mg 6.3 ± 0.6 mg/kg	C_{free} 493 ± 79 mg/kg	

(Values in parenthesis are indicative values)

NIST-154C — Titanium dioxide - Purity — 90 g

This Standard Reference Material® (SRM®) is intended primarily for use in the evaluation of techniques employed in the assay of titanium dioxide in the paint and ceramic industries.

Certified value

Titanium dioxide 99.951 %

Informational values for impurities

BCS CRM201A — Nepheline Syenite — 100 g

SiO_2 (57.3) %	MgO (0.025) %	Mn_2O_3 (0.007) %
Al_2O_3 (23.54) %	Na_2O (7.53) %	SrO (0.43) %
TiO_2 (0.05) %	K_2O (8.9) %	L.O.I. (0.76) %
Fe_2O_3 (0.12) %	P_2O_5 (0.025) %	
CaO (1.07) %	BaO (0.37) %	

(Values in parenthesis are indicative values)

BCS CRM202A — Plaster (Gypsum) — 100 g

SiO_2 (1.38) %	CaO (37.4) %	P_2O_5 (<0.01) %
Al_2O_3 (0.33) %	MgO (0.39) %	SrO (0.33) %
TiO_2 (0.03) %	Na_2O (<0.03) %	SO_3 (53) %
Fe_2O_3 (0.1) %	K_2O (0.1) %	

(Values in parenthesis are indicative values)

Code	Product	Unit

BCS CRM203A — Talc — 100 g

SiO_2 (59.7) %	CaO (0.25) %	P_2O_5 (0.13) %
Al_2O_3 (0.3) %	MgO (32.08) %	L.O.I. (6.78) %
TiO_2 (<0.01) %	Na_2O (0.02) %	
Fe_2O_3 (0.22) %	K_2O (0.005) %	

(Values in parenthesis are indicative values)

BCS CRM204A — Zircon — 100 g

SiO_2 (37,6) %	CaO (0.15) %	P_2O_5 (0.77) %
Al_2O_3 (0.74) %	MgO (0.012) %	SnO_2 (1.69) %
TiO_2 (2.22) %	Na_2O (0.014) %	$ZrO2+HfO_2$ (53.8) %
Fe_2O_3 (0.18) %	K_2O (0.017) %	L.O.I. (0.5) %

(Values in parenthesis are indicative values)

Multielement glass for XRF analysis – type A – type B

BAM-S005A — Multielement glass for XRF analysis (soda lime glass) - disc 39 mm x 5 mm (26 g - 30 g) — disc

Certified values

Arsenic (III) oxide 132 ± 8 mg/kg	Tin (IV) oxide 100 ± 7 mg/kg
Barium oxide 115 ± 9 mg/kg	Sulfur trioxide 1942 ± 85 mg/kg
Cadmium oxide 62 ± 4 mg/kg	Strontium oxide 151 ± 7 mg/kg
Cerium (IV) oxide 105 ± 6 mg/kg	Titanium (IV) oxide 164 ± 9 mg/kg
Chloride 247 ± 33 mg/kg	Vanadium (V) oxide 350 ± 22 mg/kg
Cobalt oxide 49.4 ± 2.4 mg/kg	Zinc oxide 203 ± 10 mg/kg
Chromium (III) oxide 15.6 ± 2.4 mg/kg	Zirconium (IV) oxide 842 ± 125 mg/kg
Copper (II) oxide 112 ± 5 mg/kg	Silicon (IV) oxide (71) %
Iron (III) oxide 422 ± 11 mg/kg	Sodium oxide (13.7) %
Manganese (II) oxide 124 ± 5 mg/kg	Calcium oxide (10.5) %
Molybdenum (VI) oxide 343 ± 12 mg/kg	Magnesium oxide (2.3) %
Nickel (II) oxide 59.0 ± 2 mg/kg	Aluminium oxide (1.1) %
Lead (II) oxide 202 ± 8 mg/kg	Potassium oxide (0.7) %
Antimony (III) oxide 132 ± 7 mg/kg	Certified values
Selenium 19.6 ± 1.7 mg/kg	

(Values in parenthesis are indicative values)

BAM-S005B — Multielement glass for XRF analysis (soda lime glass) - disc 39 mm x 5 mm (26 g - 30 g) — disc

Certified values

Arsenic (III) oxide 132 ± 8 mg/kg	Selenium 19.6 ± 1.2 mg/kg
Barium oxide 115 ± 5 mg/kg	Tin (IV) oxide 100 ± 7 mg/kg
Cadmium oxide 62 ± 3 mg/kg	Sulfur trioxide 1942 ± 57 mg/kg
Cerium (IV) oxide 105 ± 5 mg/kg	Strontium oxide 151 ± 7 mg/kg
Chloride 247 ± 24 mg/kg	Titanium (IV) oxide 163 ± 7 mg/kg
Cobalt oxide 49.4 ± 2.3 mg/kg	Vanadium (V) oxide 349 ± 22 mg/kg
Chromium (III) oxide 15.2 ± 1.2 mg/kg	Zinc oxide 203 ± 6 mg/kg
Copper (II) oxide 112 ± 4 mg/kg	Zirconium (IV) oxide 842 ± 76 mg/kg
Iron (III) oxide 422 ± 10 mg/kg	Silicon (IV) oxide (71) %
Manganese (II) oxide 124 ± 5 mg/kg	Sodium oxide (13.7) %
Molybdenum (VI) oxide 343 ± 12 mg/kg	Calcium oxide (10.5) %
Nickel (II) oxide 59.0 ± 1.9 mg/kg	Magnesium oxide (2.3) %
Lead (II) oxide 202 ± 7 mg/kg	Aluminium oxide (1.1) %
Antimony (III) oxide 132 ± 6 mg/kg	Potassium oxide (0.7) %

(Values in parenthesis are indicative values)

Coals

Code	Product	Unit

BCR-182 — Steam coal - Elements, ash and gross calorific value — 15 g

A medium volatile coal of high ash content.

Certified values

C 732.9 g/kg	Mn 195 mg/kg	Zn 33.3 mg/kg
Cd 0.057 mg/kg	N 16.36 g/kg	Ash 122.7 g/kg
Cl 3.70 g/kg	Se 0.68 mg/kg	GCV* 29.68 MJ/kg
Hg 0.040 mg/kg	V 24.3 mg/kg	

Indicative values for Al, As, B, Br, Ce, Co, Cr, Cu, Fe, H, K, La, Mn, Na, Ni, Pb, Rb, Sc, Th, Ti, Vol. matter

*Gross calorific value

BCR-331 — Low volatile steam coal - Sulphur — 20 g

Certified value

S 4.99 g/kg

BCR-332 — High volatile industrial coal - Sulphur — 20 g

Certified value

S 9.61 g/kg

BCR-333 — Coking steam coal - Sulphur — 20 g

Certified value

S 13.44 g/kg

Coals

Code	Product	Unit
BCR-335	Flame coal - Sulphur Certified value S..... 50.8 g/kg	20 g
BCR-336	High volatile steam coal - Sulphur Certified value S..... 32.90 g/kg	20 g
BCR-460	Coal - Fluorine Certified value F..... 225 mg/kg Indicative value for Cl	40 g
NCS FC82007	Coal - Fluorine Certified value F.....248±12 µg/g	50 g
NCS FC82008	Coal - Fluorine Certified value F.....864±16 µg/g	50 g
NCS FC82009	Coal - Fluorine Certified value F.....1496±20 µg/g	50 g
NIST-2682B	Coal (sub-bituminous) - Sulphur, mercury and heat of combustion Certified values S.....0.4917 % Hg.....108.8 µg/kg Indicative values for chlorine, ash content, gross calorific value	50 g
NIST-2683B	Coal (bituminous) - Sulphur Certified value S.....1.955 % Indicative value for Furnace ash	50 g
NIST-2684B	Coal (bituminous) - Sulphur, mercury and heat of combustion Certified values S.....3.076 % Heat of combustion ..... 28.56 MJ/kg Hg ..... 97.4 µg/kg Indicative values for Ash content, Gross calorific value	50 g
NIST-2692b	Coal (bituminous) - Sulphur, mercury and gross calorific value Certified values S.....1.170 % ± 0.020 % Chlorine.....1651 ± 28 mg/kg Hg ..... 133.3 µg/kg ± 4.1 µg/kg Reference values Ash Content (mass fraction) .....7.90 % Gross Calorific Value ..... 32.81 MJ/kg	50 g
NIST-2693	Coal (bituminous) - Sulphur and mercury Certified values S.....0.4571 % Hg.....37.3 µg/kg Cl..... 369.6 mg/kg	50 g
NIST-2685B	Coal - Sulphur, mercury and heat of combustion This Standard Reference Material (SRM®) is intended primarily for use in the evaluation of techniques employed in the determination of sulfur, mercury, ash content, and calorific value (MJ·kg-1) in coal and materials of a similar matrix. NIST-2685b consists of 50 g of bituminous coal ground to pass a 250 µm (60 mesh) sieve, homogenized, and packaged in an amber glass bottle. Certified values S.....4.730 % Cl.....517 mg/kg Hg ..... 146.2 µg/kg Indicative values for the ash content, gross calorific value and elements	50 g
NIST-1632C	Coal (bituminous) - Elements Certified values H .....5.11% Ba .....41.1 mg/kg Selenium ..... 1.326 mg/kg S.....1.462 % Co.....3.48 mg/kg Sodium..... 298.8 mg/kg Potassium .....0.1100 % Mn.....13.04 mg/kg Strontium..... 63.8 mg/kg Chlorine.....0.1139 % Hg.....0.0938 mg/kg Thorium..... 1.40 mg/kg Sb..... 0.461 mg/kg Rb.....7.52 mg/kg Zinc ..... 12.1 mg/kg Indicative values for Carbon (total), N , Si, Al, As, B, Br, Ca, Cd, Ce, Cr, Cs, Co, Eu, Fe, Hf, Mg, Ni, Pb, Sm, Sc,Ti, U, V, Ash	50 g

Code	Product	Unit
NIST-1635	Coal - Trace elements Certified values	75 g

As 0.42 mg/kg	Fe 0.239 %	Se 0.9 mg/kg
Cd 0.03 mg/kg	Mn 21.4 mg/kg	Th 0.62 mg/kg
Cr 2.5 mg/kg	Ni 1.74 mg/kg	U 0.24 mg/kg
Cu 3.6 mg/kg	Pb 1.9 mg/kg	V 5.2 mg/kg
F 25.9 mg/kg	S 0.3616 %	Zn 4.7 mg/kg

Indicative values for Al, Ce, Co, Eu, Ga, Hf, Hg, Na, Sb, Sc, Ti

Code	Product	Unit
NCS FC28001J	Coal (bitumite) - Elements and properties Coal type: Bitumite Certified values	50 g

C 78.35 %	Ash 9.63 %
H 4.28 %	Volatile matter 24.43 %
N 1.36 %	Relative density (20°C) 1.41
Total S 0.50 %	Gross calorific value 31.47 MJ/kg

Code	Product	Unit
NCS FC28002H	Coal - Elements and properties Coal type: Bitumite Certified values	50 g

C 57.84 %	Ash 28.69 %
H 3.77 %	Volatile matter 27.27 %
N 1.08%	Relative density (20°C) 1.57
Total S 1.5 %	Calorific value 23.63 MJ/kg

Code	Product	Unit
NCS FC28003F	Coal - Elements and properties Coal type: Anthracite Certified values	50 g

C 78.22 %	Ash 16.29 %
H 0.95 %	Volatile matter 6.32 %
N 0.23 %	Relative density (20°C) 1.95
Total S 0.28 %	Calorific value 26.44 MJ/kg

Code	Product	Unit
NCS FC28004E	Coal - Elements and properties Coal type: Anthracite Certified values	50 g

C 66.8 %	Ash 28.13 %
H 1.43 %	Volatile matter 4.81 %
N 0.74 %	Relative density (20°C) 1.89
Total S 0.99 %	Calorific value 23.8 MJ/kg

Code	Product	Unit
NCS FC28005C	Coal (anthracite) - Elements and properties Coal type: Anthracite Certified values	50 g

C 80.73 %	Ash 11.63 %
H 2.74 %	Volatile matter 6.94 %
N 1.06 %	Relative density (20°C) 1.57
S 1.86 %	Gross calorific value 30.84 MJ/kg

Code	Product	Unit
NCS FC28008D	Coal - Elements and properties Coal type: Bitumite Certified values	50 g

C 66.71 %	Ash 21.65 %
H 3.63 %	Volatile matter 18.34 %
N 1.19 %	Relative density (20°C) 1.54
Total S 3.54 %	Calorific value 27.06 MJ/kg

Code	Product	Unit
NCS FC28009E	Coal - Elements and properties Coal type: Bitumite Certified values	50 g

C 54.1 %	Ash 32.78 %
H 3.02 %	Volatile matter 17.14 %
N 0.97 %	Relative density (20°C) 1.73
Total S 4.09 %	Calorific value 21.5 MJ/kg

Code	Product	Unit
NCS FC28011C	Coal - Elements and properties Certified values	50 g

C 72.79 %	Ash 20.41 %
H 2.12 %	Volatile matter 6.45 %
N 0.52 %	Density (20°C) 1.72
Total S 2.20 %	Gross calorific value 27.27 MJ/kg

Code	Product	Unit
NCS FC28017	Coal - Elements and properties Coal type: Anthracite Certified values C ..... 73.64 % H ..... 0.91 % N ..... 0.23 % Total S..... 0.21 % Ash ..... 21.01 % Volatile matter ..... 5.9 % Relative density (20°C) ..... 1.97 Calorific value..... 25.01 MJ/kg	50 g
NCS FC28101	Coal - Elements and properties Coal type: Anthracite Certified values C ..... 90.27 % H ..... 3.01 % N ..... 0.60 % Total S..... 0.20 % Ash ..... 3.95 % Volatile matter ..... 6.64 % Relative density (20 °C) ..... 1.47 Calorific value..... 34.34 MJ/kg	50 g
NCS FC28102	Coal - Elements and properties Coal type: Anthracite Certified values C ..... 87.47 % H ..... 2.86 % N ..... 0.60 % Total S..... 0.19 % Ash ..... 6.46 % Volatile matter ..... 7.90 % Relative density (20 °C) ..... 1.5 Calorific value..... 33.1 MJ/kg	50 g
NCS FC28103	Coal - Elements and properties Coal type: Anthracite Certified values C ..... 81.55 % H ..... 3.33 % N ..... 1.30 % Total S..... 0.36 % Ash ..... 10.51 % Volatile matter ..... 9.45 % Relative density (20 °C) ..... 1.47 Calorific value..... 31.8 MJ/kg	50 g
NCS FC28104	Coal - Elements and properties Coal type: Anthracite Certified values C ..... 81.60 % H ..... 3.52 % N ..... 1.34 % Total S..... 0.41 % Ash ..... 10.09 % Volatile matter ..... 11 % Relative density (20 °C) ..... 1.45 Calorific value..... 32.04 MJ/kg	50 g
NCS FC28105	Coal - Elements and properties Coal type: Anthracite Certified values C ..... 81.54 % H ..... 3.70 % N ..... 1.16 % Total S..... 1.06 % Ash ..... 9.61 % Volatile matter ..... 12.21 % Relative density (20 °C) ..... 1.43 Calorific value..... 32.31 MJ/kg	50 g
NCS FC28106	Coal - Elements and properties Coal type: Bitumite Certified values C ..... 79.09 % H ..... 4.95 % N ..... 1.38 % Total S..... 1.72 % Ash ..... 8.56 % Volatile matter ..... 31.92 % Relative density (20 °C) ..... 1.35 Calorific value..... 32.98 MJ/kg	50 g
NCS FC28107	Coal - Elements and properties Coal type: Bitumite Certified values C ..... 79.89 % H ..... 3.80 % N ..... 1.12 % Total S..... 0.67 % Ash ..... 10.41 % Volatile matter ..... 15.30 % Relative density (20 °C) ..... 1.43 Calorific value..... 31.64 MJ/kg	50 g
NCS FC28108	Coal - Elements and properties Coal type: Bitumite Certified values C ..... 72.94 % H ..... 4.46 % N ..... 1.26 % Total S..... 0.57 % Ash ..... 13.68 % Volatile matter ..... 30.84 % Relative density (20 °C) ..... 1.42 Calorific value..... 29.9 MJ/kg	50 g

Code	Product	Unit
NCS FC28109	Coal - Elements and properties Coal type: Anthracite Certified values C ..... 79.42 % H ..... 3.28 % N ..... 1.09 % Total S ..... 0.58 % Ash ..... 11.98 % Volatile matter ..... 11.30 % Relative density (20 °C) ..... 1.49 Calorific value ..... 30.66 MJ/kg	50 g
NCS FC28110	Coal - Elements and properties Coal type: Bitumite Certified values C ..... 75.96 % H ..... 4.56 % N ..... 1.33 % Total S ..... 0.87 % Ash ..... 8.42 % Volatile matter ..... 32.94 % Relative density (20 °C) ..... 1.41 Calorific value ..... 30.92 MJ/kg	50 g
NCS FC28111	Coal - Elements and properties Coal type: Bitumite Certified values C ..... 60.24 % H ..... 3.73 % N ..... 1.04 % Total S ..... 1.28 % Ash ..... 25.19 % Volatile matter ..... 28.39 % Relative density (20 °C) ..... 1.57 Calorific value ..... 24.35 MJ/kg	50 g
NCS FC28112	Coal - Elements and properties Coal type: Bitumite Certified values C ..... 78.75 % H ..... 5.01 % N ..... 1.31 % Total S ..... 2.10 % Ash ..... 8.08 % Volatile matter ..... 33.70 % Relative density (20 °C) ..... 1.33 Calorific value ..... 33.04 MJ/kg	50 g
NCS FC28113	Coal - Elements and properties Coal type: Bitumite Certified values C ..... 74.80 % H ..... 4.47 % N ..... 1.02 % Total S ..... 0.27 % Ash ..... 7.06 % Volatile matter ..... 33.40 % Relative density (20 °C) ..... 1.41 Calorific value ..... 30.03 MJ/kg	50 g
NCS FC28114	Coal - Elements and properties Coal type: Bitumite Certified values C ..... 76.36 % H ..... 4.54 % N ..... 1.08 % Total S ..... 0.20 % Ash ..... 4.66 % Volatile matter ..... 33.07 % Relative density (20 °C) ..... 1.4 Calorific value ..... 30.73 MJ/kg	50 g
NCS FC28115	Coal - Elements and properties Coal type: Bitumite Certified values C ..... 77.44 % H ..... 4.42 % N ..... 1.21 % Total S ..... 0.42 % Ash ..... 6.38 % Volatile matter ..... 32.22 % Relative density (20 °C) ..... 1.41 Calorific value ..... 31.05 MJ/kg	50 g
NCS FC28116	Coal - Elements and properties Coal type: Bitumite Certified values C ..... 78.68 % H ..... 4.59 % N ..... 1.34 % Total S ..... 0.54 % Ash ..... 6.08 % Volatile matter ..... 32.34 % Relative density (20 °C) ..... 1.39 Calorific value ..... 31.82 MJ/kg	50 g
NCS FC59001	Coke - Sulphur, ash and volatile matter Certified values Total Sulphur ..... 0.63±0.03 % Ash ..... 7.22±0.06 % Volatile matter ..... 1.39±0.08 %	60 g
NCS FC59002	Coke - Sulphur, ash and volatile matter Certified values Total Sulphur ..... 0.47±0.02 % Ash ..... 12.62±0.08 % Volatile matter ..... 1.5±0.2 %	60 g
NCS FC82004	Coal - Chlorine Certified value Cl ..... 0.010±0.002 %	50 g

Coals

Code	Product	Unit
NCS FC82005	Coal - Chlorine Certified value Cl.....0.057±0.003 %	50 g
NCS FC82006	Coal - Chlorine Certified value Cl.....0.110±0.006 %	50 g
NCS FC82001	Coal - Arsenic and phosphorous Certified value As.....15±1 µg/g P ..... 0.031±0.002%	50 g
NCS FC82002	Coal - Arsenic and phosphorous Certified value As.....34±2 µg/g P ..... 0.007±0.001%	50 g
NCS FC82003	Coal - Arsenic and Phosphorus Certified value As.....51±3 µg/g P ..... 0.092±0.005%	50 g
NCS FC62001	Bituminous Coal Certified values M_{ad} .....4.51% V_{ad} ..... 22.89% $S_{t,d}$ .....1.53% A_{ad} .....21.17% V_d ..... 23,97% $Q_{gr,ad}$ ..... 23.91 MJ/kg A_d .....22.17% $S_{t,ad}$ ..... 1,46% $Q_{gr,d}$ ..... 25.04 MJ/kg M_{ad}, A_{ad}, V_{ad}, $S_{t,ad}$ and $Q_{gr,ad}$ mean moisture, ash, volatile material, total sulfur and calorific value of air dried sample; A_d, V_d, $S_{t,d}$ and $Q_{gr,d}$ mean ash, volatile material, total sulfur and calorific value of dried sample.	20 g
NCS FC62002	Bituminous Coal Certified values M_{ad} .....2.27% V_{ad} ..... 4.21% $S_{t.d}$ .....2.95% A_{ad} .....25.82% V_d ..... 4.31% $Q_{gr.ad}$ ..... 23.48 MJ/kg A_d .....26.42% $S_{t.ad}$ ..... 2.88% $Q_{gr.d}$ ..... 24.02 MJ/kg M_{ad}, A_{ad}, V_{ad}, $S_{t,ad}$ and $Q_{gr,ad}$ mean moisture, ash, volatile material, total sulfur and calorific value of air dried sample; A_d, V_d, $S_{t,d}$ and $Q_{gr,d}$ mean ash, volatile material, total sulfur and calorific value of dried sample.	20 g
NIST-2775	Foundry coke - Sulphur Certified value S.....0.5816 % Indicative values for ash, volatile matter, carbon, hydrogen and nitrogen	50 g
NIST-2776	Foundry coke - Sulphur, ash and volatile matter Certified values S.....0.825 ± 0.016 % Indicative values for ash, volatile matter, carbon, hydrogen, nitrogen	50 g
NIST-2718	Green petroleum coke - Trace elements Certified values Al..... 16.5 mg/kg Fe .....290 mg/kg S..... 47032 mg/kg Ca ..... 174 mg/kg Ni .....139.1 mg/kg V..... 302 mg/kg Indicative values for C, Co, H, N, Na, Si, Ash, Volatile matter, Gross calorific value	50 g
NIST-2719	Calcinated petroleum coke - Trace elements Certified values Al..... 58.9 mg/kg Fe .....201.6 mg/kg S..... 8877 mg/kg Ca ..... 57.7 mg/kg Ni .....204 mg/kg V..... 58.6 mg/kg Indicative values for C, Co, H, N, Na, Si, Ash, Volatile content, Gross calorific value	50 g

LGC Standards, Queens Road, Teddington, Middlesex TW11 0LY, UK
www.lgcstandards.com

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