

Metal and Quality, LLC

CERTIFICATE OF ANALYSIS

CRM C015 –C018

(DSZU 083.28-2010)

Set for Spectral Analysis of Stainless Steel



INFORMATION

Certified Reference Materials of stainless steel C015 – C018 - Set for Spectral Analysis, produced in conformity to the Certificate No.1106 authorized by State Committee of Ukraine for Technical Regulation and Consumer Policy

APPLICABILITY

The CRMs C015 – C018 is intended for verification, calibration of measuring instruments, for metrological certification and control of errors of measurements methods at definition of chemical compound of stainless steel using Optical Emission and X-ray Spectrometry methods

DEVELOPER AND MANUFACTURER

Metal and Quality, LLC

CERTIFIED VALUES (bold)

Mass fraction in % by weight	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Al	Cu	W	V	Ca	N
C015	0.087	0.214	0.420	0.059	0.0118	15.36	12.15	0.89	0.177	0.008	0.070	0.023	0.021	0.0017	0.020
C016	0.281	1.16	3.26	0.0174	0.0192	21.9	7.47	0.52	0.72	0.007	0.054	0.014	0.036	0.0004	0.010
C017	0.053	0.61	2.03	0.0298	0.040	19.21	10.85	2.36	0.32	0.28	0.36	0.20	0.084	0.0031	0.018
C018	0.125	0.53	1.09	0.0099	0.0268	17.54	9.33	0.189	0.54	0.086	0.163	0.066	0.048	0.0003	0.009

Italics - approximate value

Estimate of uncertainty	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Al	Cu	W	V	Ca	N
C015	0.002	0.005	0.006	0.002	0.0008	0.06	0.04	0.02	0.004	-	0.003	0.003	0.002	0.0004	0.001
C016	0.004	0.02	0.04	0.0008	0.0008	0.1	0.04	0.02	0.02	0.001	0.003	0.004	0.004	0.0001	0.001
C017	0.002	0.01	0.02	0.0009	0.001	0.06	0.05	0.03	0.01	0.02	0.01	0.01	0.003	0.0006	0.001
C018	0.002	0.01	0.01	0.0005	0.0007	0.06	0.05	0.006	0.01	0.004	0.004	0.004	0.003	0.0001	0.001

*The certified values are calculated in accordance with the national standard DSTU GOST 8.532-2003
Uncertainty estimated as the half width confidence interval C(95%) of Student's t-distribution*

SPECIFICATION

CRMs are made from forged and heat-treated steels in cylinders form, 40 mm diameter and 25 mm thick

HOMOGENEITY

The homogeneity was evaluated according to ISO Guide 35:2006 (7.7 Evaluating a homogeneity study) and DSTU GOST 8.531:2002 "Reference materials of composition of solid and disperse materials. Ways of homogeneity assessment"

TRACEABILITY

The traceability of CRMs DSZU C015 - DSZU C018 established in accordance with ISO Guide 30-35. The characterisation of CRMs achieved by means inter-laboratory experiment. Average results of chemical methods have been obtained by two analysts, from 3 to 6 measurements by each. Average results of spectral methods have been obtained from 10 measurements. At analyses used standardized and certified methods of analysis: combustion coulometric and infrared, Spark-OES, JDS-OES, ICP-OES, XRF, F-AAS, combustion with chromatography (N), titrimetric, photometric. At analysis only CRMs were used

CRM VALIDITY

Term of fitness CRM: unlimited, at the observance of terms of storage and application.

The working surface of the sample should be purified before use. Reference material will remain stable provided that it is not subjected to excessive heat (e.g. during preparation of the working surface).

DATE OF ISSUE October 2010

DELIVERY

CRM, packed into a box and the Certificate

SAFETY

The reference material and packing do not contain substances which can directly influence health

PARTICIPATING LABORATORIES (Ukraine)

OJSC «ArcelorMittal Krivy Rig»
OJSC «Dnepropetsstal»
OJSC "Energomashspetsstal"
OJSC "Yenakievo Metallurgical Works"
OJSC "AzovElectroStal"
OJSC «Zaporizhstal»
State Enterprise "Ukrainian Special Steels Institute"
JSC " Krivorozhskiy Factory of Mountain Equipment (KZGO)"
OJSC "Ilyich Iron and Steel Works of Mariupol"
OJSC "Azovstal"
OJSC Nikopol factory of pipeline armature
CJSC "Donetsksteel"
State Enterprise "Browary Powder Metallurgy Plant"
"Metpromservice" LTD
CJSC "Ferrotrading"

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