

Metal and Quality, LLC
CERTIFICATE OF ANALYSIS
CRM CX07
Carbon Steel



APPLICABILITY

CRM CX07 (DSZU No.083.22-07) is intended for verification of analytical methods, for calibration of analytical instruments at definition of chemical compound carbon steels

MEAN VALUES OF LABORATORIES

Lab. No.	C	Si	Mn	S	P	Cr	Ni	Cu
1	0.1065	0.295	0.625	0.0194	0.0140	0.0790	0.0360	0.0700
2	0.1090	0.297	0.631	0.0196	0.0147	0.0800	0.0360	0.0720
3	0.1120	0.309	0.632	0.0203	0.0148	0.0830	0.0361	0.0722
4	0.1120	0.310	0.632	0.0205	0.0152	0.0830	0.0370	0.0735
5	0.1140	0.310	0.632	0.0205	0.0152	0.0840	0.0390	0.0739
6	0.1140	0.311	0.636	0.0205	0.0152	0.0840	0.0396	0.0739
7	0.1150	0.312	0.636	0.0206	0.0152	0.0850	0.0400	0.0740
8	0.1160	0.312	0.637	0.0207	0.0154	0.0850	0.0410	0.0740
9	0.1170	0.313	0.637	0.0207	0.0154	0.0850	0.0430	0.0747
10	0.1170	0.315	0.639	0.0211	0.0158	0.0860	0.0430	0.0760
11	0.1190	0.316	0.649	0.0213	0.0163	0.0860	0.0440	0.0760
12	0.1220	0.319	0.651	0.0214	-	-	-	-
M(M)	0.1145	0.312	0.636	0.0206	0.0152	0.0836	0.0395	0.0737
s(M)	0.0043	0.007	0.007	0.0006	0.0006	0.0023	0.0030	0.0018

M(M) - Mean of intralaboratory means

s(M) - Standard deviation of the mean values of laboratories

Uncertainty C(95%) estimated as the half-width confidence interval of Student's t-distribution, when n is the number of laboratory means

$$C(95\%) = \frac{t \cdot s(M)}{\sqrt{n}}$$

CERTIFIED VALUES

Elements	C	Si	Mn	S	P	Cr	Ni	Cu
Certified value (Mass fraction in %)	0.115	0.312	0.636	0.0206	0.0152	0.084	0.040	0.074
Estimate of uncertainty (Confidence 0.95)	0.003	0.005	0.006	0.0004	0.0004	0.002	0.002	0.001

Information values* (mass fraction in % by weight)

Elements	As	Ti	Mo	V	Nb	Al	Co	Sb	Sn	Pb	Zn	W	N
Information values	0.0030	0.0007	0.0040	0.0009	0.0001	0.007	0.0024	0.0006	0.0021	0.0003	0.0008	0.0015	0.0048
Standard deviation	0.0002	0.0001	0.0001	0.0001	0.0001	0.001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0004	0.0003

* - The data (except nitrogen) are received in one laboratory by repeated ICP measurements. The data of nitrogen are received by Combustion Infrared Method

CERTIFICATE VALIDITY

December 2027

SPECIFICATION

CRM is made as granules of steel wire in diameter 0.8 mm, length 0.2 - 0.5 mm

DELIVERY

CRM in glass (250 g), packed into a box and the Certificate

NOTE

Minimum sample size for chemical analysis is 0.5 g

STORAGE

The material should be kept in a dry room in the closed bottle

SAFETY

CRM CX07 and packing does not contain explosives and radioactive substances and substances which might influence health and the environment

THE METHODS USED

Combustion coulometric and infrared, Gravimetric, Photometric, Titration, Flame AAS, ICP OES, Inert gas fusion

PARTICIPATING LABORATORIES (Ukraine)

Azovstal PJSC
Ilyich Iron and Steel Works of Mariupol PJSC
Zaporizhstal PJSC
Dneprospetsstal PJSC
DMKD PJSC
Khartsyzsk Tube Works PJSC
Kerch Pointer Factory LTD
Ukrainian Special Steels Institute SE
Powder Metallurgy Plant SE
Energostal Scientific Research Centre SE
Scientific Research Tube Institute SE

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