

Metal and Quality, LLC
CERTIFICATE OF ANALYSIS
RM CX012
Carbon Steel



APPLICABILITY Reference material CX012 is intended for verification of analytical methods, for calibration of analytical instruments at definition of chemical compound carbon steels

MEAN VALUES OF LABORATORIES (mass fraction in %)

No.	C	Si	Mn	P	S	Cr	Ni	Cu	Mo	Al	Co	Sn	As	N	Ti	Ca
1	1.199	0.217	0.228	0.0150	0.0140	0.125	0.041	0.068	0.0019	0.0021	0.0025	0.0035	0.0030	0.006	0.005	0.003
2	1.210	0.217	0.229	0.0154	0.0140	0.128	0.043	0.070	0.0020	0.0040	0.0030	0.0040	0.0054	0.008		
3	1.210	0.220	0.237	0.0157	0.0140	0.130	0.043	0.070								
4	1.220	0.222	0.237	0.0160	0.0141	0.132	0.049	0.070								
5	1.230	0.225	0.239	0.0160	0.0146	0.133	0.049	0.072								
6	1.230	0.235	0.240	0.0163	0.0150	0.139	0.050	0.072								
7	1.241	0.236	0.243	0.0170	0.0150	0.140	0.050	0.077								
8		0.238	0.244		0.0152	0.145										
M(M)	1.220	0.226	0.237	0.0159	0.0145	0.134	0.046	0.071	0.0020	0.0031	0.0028	0.0038	0.0042	0.007	0.005	0.003
s(M)	0.015	0.009	0.006	0.0006	0.0005	0.007	0.004	0.003	0.0001	0.0013	0.0004	0.0004	0.0017	0.0001	-	-

M(M) - Mean of intralaboratory means; s(M) - Standard deviation of the mean values of laboratories

CERTIFIED VALUES (bold)

	C	Si	Mn	P	S	Cr	Ni	Cu
Certified	1.220	0.226	0.237	0.0159	0.0145	0.134	0.046	0.071
M(M)								
Uncertainty	0.013	0.007	0.005	0.0006	0.0004	0.006	0.004	0.003
C(95%)								

Uncertainty estimated as the half-width confidence interval of Student's t-distribution, when n is the number of laboratory means: $C(95\%) = t \cdot s(M) / \sqrt{n}$

CERTIFICATE VALIDITY July 2027

SPECIFICATION Reference material made as non-oxidized chips with a fraction of 0.315 - 1.5 mm from a rod of carbon steel grade U12A (DSTU 3833-98, GOST 1435-99, EN CT120, DIN 1.1654, W1-11-1/2)

DELIVERY RM in glass (150 g), packed into a box and Certificate

NOTE Minimum sample size at analysis is 0.5 g

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

SAFETY RM CX012 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 and ICP OES

PARTICIPATING LABORATORIES (Ukraine)

ArcelorMittal Krivy Rig PJSC
 Azovstal PJSC
 DMKD PJSC
 Dneprometiz PJSC
 Dnipropetrovsk Switches (DnSZ) PJSC
 Ilyich Iron and Steel Works of Mariupol PJSC
 Metal & Quality PJSC
 Zaporizhstal PJSC

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