

Metal and Quality, LLC
Reference Material
Certificate of Chemical Analysis
RM CX03a
Carbon Steel



APPLICABILITY Reference Material CX03a is intended for calibration of analytical instruments in the determination of chemical composition of carbon steels

MEAN VALUES OF LABORATORIES

Lab. No.	Mass fraction in %							
	C	Mn	Si	S	P	Ni	Cr	Cu
1	0.199	0.360	0.0095	0.0311	0.0277	0.0149	0.0443	0.0185
2	0.202	0.366	0.0130	0.0325	0.0285	0.0156	0.0450	0.0198
3	0.203	0.366	0.0150	0.0327	0.0293	0.0156	0.0483	0.0216
4	0.204	0.367	0.0165	0.0335	0.0294	0.0158		
5	0.208	0.372	0.0180	0.0340				
6	0.209	0.382						
7	0.209							
8	0.210							
M(M)	0.206	0.369	0.0144	0.0328	0.0287	0.0155	0.0459	0.0200
s(M)	0.004	0.007	0.0033	0.0011	0.0008	0.0004	0.0020	0.0016

M(M) - Mean of intralaboratory means

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

CERTIFIED VALUES (mass fraction in %)

Elements	C	Mn	Si	S	P	Ni	Cr	Cu
Certified	0.206	0.369	0.014	0.033	0.029	0.0155	0.046	0.020
Uncertainty C(95%)	0.003	0.008	0.004	0.001	0.001	0.0005	0.004	0.003

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

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

SPECIFICATION Reference material made as chips from sheet carbon steel grade 03KP (DSTU 2651:2005, GOST 380-2005, A107, A283 Grade C, SA-283 C) production of Zaporizhstal PJSC

TRACEABILITY The characterization of material has been achieved by means interlaboratory experiment in accordance to ISO Guide 35:2006. In each laboratory applied the methods of analysis of their choice. In the analysis were used exclusively standardized methods and certified reference materials

HOMOGENEITY The homogeneity was evaluated according to ISO Guide 35:2006 (7.7.Evaluating a homogeneity study)

DELIVERY	Packing - 200 grams in glass bottle and Certificate
DATE OF ISSUE	February, 2016
VALID	February, 2031
SAFETY	RM CX03a and packing does not contain explosives and radioactive substances and substances which might influence health and the environment
NOTE	Reference material should be stored in a tightly closed bottle in a dry and cool place. When the bottle is opened for analysis, it should be stoppered immediately after use.

PARTICIPATING LABORATORIES (Ukraine)

ArcelorMittal Kryvyi Rih, PJSC
Dneprovsky Iron & Steel Works aft. Dzerzhinsky, PJSC
Dnipropetrovsk Switches (DnSZ), PJSC
Ilyich Iron and Steel Works of Mariupol, PJSC
Metpromservis, Ltd
Iskra, Scientific and production complex, SE
Zaporizhstal, PJSC
Zaporozhye Steel Works, Ltd

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