

Metal and Quality, LLC
CERTIFICATE OF ANALYSIS
CRM Y20
Carbon Steel



APPLICABILITY

CRM Y20 (DSZU No.083.8-02) 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	0.343	0.242	0.557	0.0192	0.0059	0.133	0.199	0.170
2	0.346	0.242	0.562	0.0193	0.0061	0.135	0.203	0.172
3	0.350	0.248	0.566	0.0195	0.0066	0.136	0.205	0.176
4	0.350	0.250	0.569	0.0196	0.0066	0.138	0.206	0.176
5	0.353	0.252	0.570	0.0201	0.0069	0.138	0.207	0.177
6	0.353	0.254	0.571	0.0208	0.0072	0.138	0.207	0.178
7	0.353	0.254	0.572	0.0209	0.0072	0.138	0.210	0.182
8	0.353	0.255	0.573	0.0212	0.0074	0.139	0.212	0.182
9	0.354	0.257	0.573	0.0215	0.0077	0.139	0.214	0.183
10	0.355	0.257	0.574	0.0219	0.0081	0.140	0.217	0.183
11	0.355	0.257	0.576	0.0221	-	0.140	-	0.188
12	0.357	0.258	0.577	0.0225	-	0.142	-	-
13	0.358	0.262	-	-	-	0.143	-	-
14	-	-	-	-	-	0.144	-	-
M(M)	0.3523	0.2529	0.5700	0.0207	0.0070	0.1388	0.2080	0.1788
s(M)	0.0042	0.0060	0.0058	0.0012	0.0007	0.0030	0.0054	0.0053

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 %)	0.352	0.253	0.570	0.0207	0.0070	0.139	0.208	0.179
Estimate of uncertainty (Confidence 0.95)	0.003	0.003	0.005	0.0005	0.0003	0.002	0.003	0.002

Information values (mass fraction in % by weight)

As	Mo	Al	Ti	V	Co	Pb	Sn	W	Sb	Zn
0.003	0.004	0.005	0.003	0.004	0.002	0.0002	0.002	0.002	0.001	0.001

CERTIFICATE VALIDITY

February 2027

SPECIFICATION

CRM is made as a broken shaving of steel thickness of 0.3 mm

DELIVERY

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

STORAGE

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

SAFETY

CRM Y20 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

PARTICIPATING LABORATORIES

DMKD PJSC, Ukraine
Zaporizhstal PJSC, Ukraine
Dneprospetsstal PJSC, Ukraine
Ukrainian Special Steels Institute SE, Ukraine
ZORIA SE, Ukraine
KZGO CJSC, Ukraine
Khartsyzsk Tube Works PJSC, Ukraine
NTZ PJSC, Ukraine
GAZ OJSC, Russia
Uralvagonzavod OJSC, Russia
Ashinskiy Metallurgical Works OJSC, Russia
Turbo - Motor Factory OJSC, Russia
Revdinsk Metizno - Metallurgical Union OJSC, Russia
Saldinski Metallurgical Works OJSC, Russia
Severski Tube Works OJSC, Russia
ICRM CJSC, Russia

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