

Metal and Quality, LLC
CERTIFICATE OF ANALYSIS
DSZU C05b
Low Alloy Steel



INFORMATION

Reference Material DSZU C05b is intended for calibration of measuring instruments at determination of chemical composition of low alloy steels using Optical Emission Spectrometry

DEVELOPER AND MANUFACTURER

Metal and Quality, LLC

CERTIFIED VALUES

C05b	C	Mn	Si	P	S	Cr	Ni	Cu	W	V	Mo	Ti	Al	Co	Nb	Sn	B	As	N
Mass fraction in % by weight	0.282	1.82	0.347	0.017	0.033	1.355	1.80	0.478	0.53	0.221	0.218	0.033	0.005	0.179	0.170	0.020	0.018	0.014	0.013
Uncertainty C(95%)	0.005	0.03	0.005	0.001	0.002	0.014	0.02	0.007	0.01	0.007	0.006	0.001	0.002	0.009	0.006	0.001	0.003	0.001	0.001

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

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

SPECIFICATION

Reference material DSZU C05b made from forged metal of vacuum induction melting as cylinders 40 mm diameter and 25 mm thick. DSZU C05b was produced by technology identical to CRM DSZU C05 and DSZU C05a

HOMOGENEITY

The homogeneity was evaluated according ISO Guide 35:2017. To evaluate of homogeneity was used OES method.

TRACEABILITY

The characterization of DSZU C05b was achieved by means inter-laboratory experiment. At analyses applied standardized methods of analysis, certified reference materials were used

RM VALIDITY

Shelf life of RM is unlimited. 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 2023

DELIVERY

RM, packed into a box and certificate

SAFETY

A Safety Data Sheet (SDS) is not required for DSZU C05b. Material DSZU C05b and packing does not contain hazardous chemical, explosives and radioactive substances and substances which might influence health and the environment

LABORATORY MEANS, mass fraction in %

n	C	Mn	Si	P	S	Cr	Ni	Cu	W	V	Mo	Ti	Al	Co	Nb	Sn	B	As	N
1	0.2700	1.7410	0.3367	0.0140	0.0300	1.3242	1.7550	0.4637	0.5025	0.2089	0.2097	0.0300	0.0029	0.1573	0.1533	0.0181	0.0150	0.0130	0.0120
2	0.2743	1.7800	0.3400	0.0155	0.0310	1.3300	1.7670	0.4683	0.5100	0.2100	0.2100	0.0318	0.0033	0.1700	0.1625	0.0190	0.0160	0.0130	0.0129
3	0.2750	1.7909	0.3410	0.0157	0.0313	1.3400	1.7700	0.4690	0.5200	0.2125	0.2106	0.0320	0.0034	0.1700	0.1670	0.0190	0.0160	0.0140	0.0129
4	0.2763	1.8033	0.3415	0.0160	0.0320	1.3450	1.7807	0.4710	0.5225	0.2151	0.2112	0.0321	0.0050	0.1748	0.1684	0.0194	0.0171	0.0143	0.0130
5	0.2778	1.8133	0.3423	0.0165	0.0335	1.3500	1.7920	0.4780	0.5239	0.2160	0.2130	0.0330	0.0063	0.1803	0.1700	0.0195	0.0198		0.0135
6	0.2820	1.8200	0.3440	0.0170	0.0349	1.3550	1.8000	0.4800	0.5300	0.2173	0.2167	0.0337	0.0065	0.1833	0.1706	0.0207	0.0210		
7	0.2849	1.8300	0.3466	0.0175	0.0359	1.3600	1.8000	0.4805	0.5317	0.2200	0.2193	0.0340	0.0070	0.1901	0.1715	0.0210	0.0220		
8	0.2870	1.8400	0.3475	0.0179	0.0360	1.3600	1.8150	0.4810	0.5367	0.2228	0.2200	0.0340	<0.005	0.1925	0.1725	0.0213			
9	0.2875	1.8500	0.3520	0.0184		1.3700	1.8163	0.4900	0.5400	0.2300	0.2200	0.0343	<0.005	0.1955	0.1735	0.0227			
10	0.2900	1.8680	0.3600	0.0190		1.3840	1.8567	0.4950	0.5495	0.2367	0.2255	0.0350			0.1880				
11	0.2915	1.8784	0.3610			1.3884			0.5583	0.2371	0.2390	0.0363							
M(M)	0.2815	1.8195	0.3466	0.0168	0.0331	1.3551	1.7953	0.4777	0.5296	0.2206	0.2177	0.0333	0.0049	0.1793	0.1697	0.0201	0.0181	0.0136	0.0129
s(M)	0.0072	0.0402	0.0080	0.0015	0.0023	0.0204	0.0297	0.0099	0.0164	0.0100	0.0088	0.0017	0.0017	0.0125	0.0088	0.0014	0.0028	0.0007	0.0005

M(M) - Mean of intralaboratory means

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

PARTICIPATING LABORATORIES (Ukraine)

DNEPROPRESS STEEL LTD
 DNEPROSPETSSTAL (DSS) PJSC
 DNIPROPEROVSK SWITCH PLANT JSC
 DNIPROVSKY METALLURGICAL PLANT PJSC
 INTERPIPE STEEL (DNIPROSTAL) LTD
 METAL & QUALITY LLC
 MOTOR SICH OJSC
 ZAPOROZHYE STEEL WORKS LTD
 ZAPORozhstal PJSC

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