

Metal and Quality LLC
CERTIFICATE OF ANALYSIS

RM C21–C26

Set for Spectral Analysis of Chromium Stainless Steel



APPLICABILITY

Reference materials C21 – C26 is intended for calibration of measuring instruments at definition of trace non-ferrous metals using Optical Emission Spectrometry

CHEMICAL COMPOSITION, mass fraction in %

No.	Pb	Sn	Sb	As	Zn	B	Ca	N	C	Si	Mn	P	Cr	Ni	Mo	V	Cu
C21	0.0002	0.0028	0.0011	0.0052	0.0026	<i>0.0019</i>	<i>0.0014</i>	<i>0.032</i>	<i>0.4</i>	<i>0.3</i>	<i>0.1</i>	<i>0.02</i>	<i>13</i>	<i>1.2</i>	<i>0.1</i>	<i>0.03</i>	<i>0.2</i>
C22	0.0228	0.0506	0.0499	0.0508	0.0187	<i>0.0300</i>	<i>0.0015</i>	<i>0.040</i>	<i>0.4</i>	<i>0.2</i>	<i>0.1</i>	<i>0.02</i>	<i>13</i>	<i>1.5</i>	<i>0.1</i>	<i>0.03</i>	<i>0.5</i>
C23	0.0009	0.0097	0.0059	0.0080	0.0028	<i>0.0043</i>	<i>0.0020</i>	<i>0.095</i>	<i>0.4</i>	<i>0.3</i>	<i>0.1</i>	<i>0.02</i>	<i>13</i>	<i>1.4</i>	<i>0.1</i>	<i>0.03</i>	<i>0.2</i>
C24	0.0017	0.0112	0.0103	0.0137	0.0035	<i>0.0071</i>	<i>0.0029</i>	<i>0.121</i>	<i>0.4</i>	<i>0.2</i>	<i>0.1</i>	<i>0.02</i>	<i>13</i>	<i>1.5</i>	<i>0.1</i>	<i>0.03</i>	<i>0.3</i>
C25	0.038	0.0949	0.0935	0.0926	0.0341	<i>0.0300</i>	<i>0.0039</i>	<i>0.100</i>	<i>0.3</i>	<i>0.3</i>	<i>0.1</i>	<i>0.02</i>	<i>13</i>	<i>1.6</i>	<i>0.1</i>	<i>0.03</i>	<i>0.7</i>
C26	0.0025	0.0042	0.0019	0.0077	0.0189	<i>0.0003</i>	<i>0.0009</i>	<i>0.025</i>	<i>0.3</i>	<i>0.3</i>	<i>0.1</i>	<i>0.02</i>	<i>13</i>	<i>1.6</i>	<i>0.1</i>	<i>0.03</i>	<i>0.7</i>

Italic - indicative values

Interlaboratory standard deviation (N = 3)

No.	Pb	Sn	Sb	As	Zn
C21	0.0001	0.0012	0.0003	0.0007	0.0005
C22	0.0011	0.0049	0.0071	0.0020	0.0052
C23	0.0003	0.0044	0.0018	0.0007	0.0004
C24	0.0003	0.0010	0.0005	0.0013	0.0001
C25	0.0160	0.0096	0.0039	0.0069	0.0019
C26	0.0005	0.0004	0.0003	0.0023	0.0059

SPECIFICATION

Reference materials are made from forged metal of induction melting as cylinders 40 mm diameter and 20 mm thick

DELIVERY

RM, packed into a box and the Certificate

SAFETY

The reference material and packing do not contain substances which can directly influence health and environment

PARTICIPATING LABORATORIES AND METHODS OF ANALYSIS

Dnepropetsstal (DSS) PJSC, Ukraine - AAS (n=6) and ICP OES (n=6)

Institute for Certified Reference Materials (ICRM) CJSC, Russia - AAS (n=5)

Chelyabinsk Metallurgical Plant (Mechel) OJSC, Russia - ICP MS (n=5)

Analysis of C21 – C26		Pb	Sn	Sb	As	Zn
C21	Lab.1	0.00014	0.0029	0.0013	0.0054	0.0029
	Lab.2	0.00018	0.0016	0.0009	0.0044	-
	Lab.3	0.00033	0.0039	(0.0038)	0.0058	0.0022
	Interlaboratory mean	0.00022	0.0028	0.0011	0.0052	0.0026
	SD	0.00010	0.0012	0.0003	0.0007	0.0005
C22	Lab.1	0.02230	0.0527	0.0558	0.0499	0.0223
	Lab.2	0.02400	0.0540	0.0520	0.0494	-
	Lab.3	0.02200	0.0450	0.0420	0.0530	0.0150
	Interlaboratory mean	0.02280	0.0506	0.0499	0.0508	0.0187
	SD	0.00110	0.0049	0.0071	0.0020	0.0052
C23	Lab.1	0.00085	0.0147	0.0055	0.0082	0.0025
	Lab.2	0.00071	0.0068	0.0043	0.0086	-
	Lab.3	0.00128	0.0075	0.0078	0.0073	0.0030
	Interlaboratory mean	0.00095	0.0097	0.0059	0.0080	0.0028
	SD	0.00030	0.0044	0.0018	0.0007	0.0004
C24	Lab.1	0.00150	0.0101	0.0108	0.0136	0.0036
	Lab.2	0.00160	0.0120	0.0100	0.0125	-
	Lab.3	0.00200	0.0116	0.0100	0.0150	0.0034
	Interlaboratory mean	0.00170	0.0112	0.0103	0.0137	0.0035
	SD	0.00030	0.0010	0.0005	0.0013	0.0001
C25	Lab.1	0.03740	0.0988	0.0960	0.0865	0.0361
	Lab.2	0.04000	0.1020	0.0955	0.0912	0.0340
	Lab.3	0.03700	0.0840	0.0890	0.1000	0.0323
	Interlaboratory mean	0.03810	0.0949	0.0935	0.0926	0.0341
	SD	0.00160	0.0096	0.0039	0.0069	0.0019
C26	Lab.1	0.00290	0.0044	0.0021	0.0075	0.0248
	Lab.2	0.00270	0.0044	0.0020	0.0055	0.0190
	Lab.3	0.00190	0.0037	0.0015	0.0100	0.0130
	Interlaboratory mean	0.00250	0.0042	0.0019	0.0077	0.0189
	SD	0.00050	0.0004	0.0003	0.0023	0.0059

CONTACTS

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