

ANALYTICAL REFERENCE MATERIALS INTERNATIONAL

LABORATORY PERFORMANCE EVALUATION DIVISION (LPED)

Certificate of Performance

Subscriber: **TQA Metals Laboratory**

Material Grade: **AISI 1018 / 28B**

Code: **LPED #4567**

Sorted	Al	As	B	C	Ca	Co	Cr	Cu	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Si	Sn	Ti	V	W	Zr
1	0.0004	0.0065	0.0001	0.1727	0.001	0.009	0.126	0.342	0.73	0.025	0.0078	0.0006	0.119	0.0066	0.008	0.0002	0.0233	0.2	0.012	0.0001	0.001	0.0004	0.0006
2	0.0006	0.007	0.0001	0.175	0.0014	0.0094	0.126	0.349	0.73	0.026	0.00793	0.001	0.119	0.0068	0.0085	0.0002	0.026	0.21	0.013	0.0003	0.001	0.003	0.001
3	0.001	0.007	0.0001	0.177	0.0015	0.0096	0.128	0.35	0.73	0.027	0.0087	0.001	0.1193	0.0068	0.0085	0.0005	0.0261	0.216	0.013	0.0009	0.0012	0.006	0.001
4	0.0017	0.0077	0.0001	0.178	0.0018	0.0097	0.1289	0.351	0.7338	0.027	0.0089	0.0012	0.12	0.0068	0.0086	0.0011	0.0272	0.217	0.0133	0.001	0.0015	0.008	0.0014
5	0.002	0.0078	0.0001	0.1786	0.00185	0.0099	0.13	0.3549	0.7349	0.028	0.0089	0.002	0.1202	0.00703	0.0088	0.0012	0.0277	0.2179	0.0136	0.001	0.0018	0.0126	0.002
6	0.002	0.0078	0.00015	0.179	0.002	0.01	0.13	0.3557	0.74	0.028	0.009	0.002	0.121	0.0071	0.0089	0.002	0.028	0.221	0.0139	0.001	0.002	<0.001	0.002
7	0.002	0.0078	0.00017	0.179	0.0024	0.01	0.13	0.357	0.744	0.0286	0.009	0.002	0.123	0.0074	0.009	0.0022	0.028	0.222	0.014	0.0012	0.002	<0.005	0.0021
8	0.002	0.008	0.00019	0.18	0.0024	0.01	0.13	0.36	0.745	0.029	0.009	0.002	0.123	0.0075	0.009	0.003	0.028	0.2228	0.014	0.002	0.002	<0.01	0.0029
9	0.0028	0.0082	0.0002	0.18	0.0025	0.01	0.13	0.362	0.7453	0.029	0.0091	0.002	0.124		0.009	0.0062	0.028	0.224	0.014	0.002	0.002		<0.0001
10	0.003	0.009	0.0002	0.18	0.0026	0.0108	0.1304	0.365	0.747	0.029	0.00912	0.0027	0.125		0.0091	<0.01	0.0284	0.2244	0.014	0.002	0.002		<0.0003
11	0.0032	0.009	0.0002	0.183	0.0026	0.011	0.131	0.366	0.748	0.029	0.0092	0.003	0.126		0.0092	<0.01	0.0286	0.2262	0.0141	0.0021	0.0022		<0.001
12	0.0038	0.0092	0.00026	0.183	0.00274	0.012	0.1314	0.3687	0.748	0.0296	0.0093		0.1269		0.0095		0.029	0.229	0.0146	0.00219	0.0029		<0.005
13	0.004	0.01	0.0003	0.1834	0.0035	0.012	0.133	0.369	0.75	0.03	0.0094		0.127		0.0096		0.029	0.23	0.0147	0.0022	0.003		
14	0.004		0.00034	0.184		0.013	0.133	0.369	0.751	0.03	0.0094		0.1286		0.01		0.0295	0.231	0.0148	0.0023	0.0034		
15	0.0043			0.184		0.015	0.134	0.3696	0.7526	0.0302	0.00946		0.13		0.01		0.03	0.235	0.015	0.00231	0.0035		
16	0.0043			0.1846		0.016	0.1343	0.37	0.7554	0.0303	0.0096		0.13		0.0105		0.0304	0.239	0.015	0.0024	0.0035		
17	0.005			0.186			0.1349	0.3708	0.756	0.031	0.0097		0.13		0.011		0.0307	0.24	0.0156	0.0025	0.004		
18	0.0069			0.1873			0.139	0.372	0.757	0.0311	0.0099		0.1317		0.011		0.031	0.241	0.0158	0.00251			
19	0.007			0.188			0.14	0.377	0.77	0.033	0.01		0.132		0.0112		0.032	0.2411	0.016	0.004			
20	0.0072			0.189			0.14	0.38	0.77	0.034	0.0102		0.133		0.012		0.0328	0.244	0.016	0.004			
Mean	0.0032	0.0080	0.0002	0.1817	0.0021	0.0110	0.1319	0.3640	0.7464	0.0291	0.0092	0.0016	0.1254	0.0070	0.0096		0.0290	0.2267	0.0144	0.0020	0.0023		
Std Dev	0.0019	0.0010	0.0001	0.0044	0.0007	0.0021	0.0042	0.0091	0.0119	0.0022	0.0006	0.0009	0.0049	0.0003	0.0011		0.0018	0.0118	0.0011	0.0010	0.0009		
Z-Score	2.11	1.20	0.00	-0.61	0.57	0.48	0.26	-2.42	0.81	0.86	-0.50	0.44	0.12	-0.67	-0.64		-3.17	-0.23	-1.27	-1.90	-0.89		

Note 1 : Subscriber data is inserted and sorted without recalculation of the mean and standard deviation.

Note 2: In order to provide LPED subscribers with a larger population of data for comparison, effective June 15, 1994, the "Certificate of Performance" may contain up to twenty data points for each element. These data points are a combination of the original "Benchmark" data acquired during the ARMI certification process as well as data that has been submitted by LPED subscribers which is statistically acceptable in accordance with the established ARMI/ILAP protocol.

CAUTION! Since the test samples are actual Certified Reference Materials, they may also be used for calibrations, type standards, etc.. If used as CRMs, use only the data labeled "Certified" on the "Certificate of Analyses".

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Date: **03/01/2001**