

Brammer Standard Company, Inc.

Certificate of Analysis

B.S. 955A

CDA Copper Alloy 955

Copper	81.1	Silicon	0.085
Tin	0.025	Manganese	0.32
Lead	0.046	Phosphorus	0.019
Zinc	0.10	Arsenic	<0.002
Iron	3.91	Antimony	0.001
Nickel	4.25	Carbon	0.005
Aluminum	10.08	Sulfur	<0.001

(analysis listed as percent by weight)

Some of the co-operating laboratories were:

Brammer Standard Co. Inc., Houston, Texas
J. Dirats and Co., Inc., Westfield, Massachusetts
VHG Labs, Manchester, New Hampshire

See data on reverse side.

Certificate No. 955A-061092

BS 955A

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Analysis	Cu	Sn	Pb	Zn	Fe	Ni	Al
1	81.0	0.021	0.044	0.097	3.89	4.25	10.02
2	81.13	0.025	0.0455	0.097	3.91	4.25	10.07
3	81.14	0.027	0.047	0.0998	3.92	4.25	10.08
4		0.028	0.048	0.100	3.92	4.26	10.11
5			0.048	0.108			10.12
Average	81.09	0.0253	0.0465	0.100	3.910	4.253	10.080
Std Dev	0.08	0.0031	0.0017	0.005	0.014	0.005	0.039
Certified	81.1	0.025	0.046	0.10	3.91	4.25	10.08

Analysis	Si	Mn	P	As	Sb	C	S
1	0.083	0.302	0.018	0.001	0.0010	0.0049	<0.0002
2	0.0838	0.32	0.018	0.0019	0.0010	0.0051	<0.001
3	0.084	0.324	0.019	<0.001	0.0011		<0.001
4	0.085	0.324	0.0221				
5	0.091	0.328					
Average	0.0854	0.320	0.0193		0.0010	0.0050	
Std Dev	0.0032	0.010	0.0019		0.0001	0.0001	
Certified	0.085	0.32	0.019	<0.002	0.001	0.005	<0.001

Data in parentheses is not certified but provided for information only.

Chemical analyses were made on millings from cross-sections of the cast discs. The individual values listed above are the average of each analyst's results.

Methods of analysis used were a combination of ASTM Standard Methods E 54-86a, E 478, plus additional ICP, and AA spectrometric methods. The following Certified Reference Materials were used to validate the analytical data listed above: NIST SRM 871, SRM 872; BAM 222, BAM227, BAM 228, BAM 361; BCS 183/4, and IPT 10A, IPT 15.

This Reference Material was tested for homogeneity by optical emission spectrometry using ASTM Standard Method E 826 and found acceptable. NIST had no similar Certified Reference Materials procurable in solid form for spectrometric comparison during the testing of this material.

A Material Safety Data Sheet (MSDS) is not required for this material. This material will not release or otherwise result in exposure to a hazardous chemical, under normal conditions of use. Inquiries concerning this Reference Material should be directed to:

Brammer Standard Co., Inc. Phone: (281) 440-9396
 14603 Benfer Road
 Houston, Texas 77069-2895 Fax: (281) 440-4432
 USA

Certified by G. R. Brammer on June 10, 1992.