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Certificate of Analysis

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Zinc-aluminum Foundry Alloys NZA-1 to NZA-7

Seven zinc-aluminum (ZA) alloys were cast as reference materials for chemical composition by the Noranda Research Centre, Noranda Inc. and donated to the Canadian Certified Reference Materials Project. These were sectioned into discs suitable for use in calibration and quality assurance applications, particularly for emission spectrometry methods.

The trimmed discs are 50 mm diameter by 12 mm thickness (2" x 1/2 "). Concentrations were established for a pre-defined measurement annulus exterior to the 6.4 mm (1/4 inch) radius.

The measurement annulus from a representative fraction of the discs was machined into chips, blended and bottled in 80-gram units to provide reference samples suitable for use in wet-chemical methods.

In a fourteen-laboratory measurement program, recommended values were established for the concentrations of three alloy constituents (aluminum, copper and magnesium) and four impurity constituents (iron, tin, lead and cadmium). The recommended values and their precision estimates at the 95% confidence level are summarized in Table 1.

Homogeneity of the disc samples was assessed from statistical analysis of measurements obtained by point-to-plane spark source emission spectrometry. Significant variance between discs was not detected except for iron in the alloys NZA-5, NZA-6 and NZA-7. For information purposes, statistical tolerance intervals were established to delimit the range of possible iron concentrations in disc samples of these alloys.

The report "ZINC-ALUMINUM FOUNDRY ALLOYS NZA-1 To NZA-7: REFERENCE MATERIALS FOR CHEMICAL COMPOSITION" is in preparation. The report describes the preparation, analytical measurement program, and the assessments used to establish recommended values and confirm acceptable homogeneity. Upon its availability, the report will be supplied with each order for NZA alloy samples.



Table 1
Recommended values for alloy constituents and impurity elements.

Recommended Value*, weight percent

	Al	Cu	Mg
NZA-1	28.70 ± 0.32	1.51 ± 0.05	0.020 ± 0.001
NZA-2	23.81 ± 0.26	3.00 ± 0.08	0.029 ± 0.003
NZA-3	25.99 ± 0.19	2.00 ± 0.04	0.0049 ± 0.0006
NZA-4	26.65 ± 0.25	2.45 ± 0.07	0.0106 ± 0.0006
NZA-5	10.85 ± 0.11	1.04 ± 0.03	0.021 ± 0.001
NZA-6	7.54 ± 0.07	3.17 ± 0.09	0.00037 ± 0.00032**
NZA-7	13.17 ± 0.26	0.212 ± 0.009	0.05 ± 0.004

	Fe	Sn	Pb	Cd
NZA-1	0.046 ± 0.003	0.0069 ± 0.0010	0.0030 ± 0.0004	0.00098 ± 0.00012
NZA-2	0.021 ± 0.002	0.0045 ± 0.0009	0.0076 ± 0.0005	0.0047 ± 0.0003
NZA-3	0.066 ± 0.006	0.0034 ± 0.0012	0.0045 ± 0.0005	0.0064 ± 0.0005
NZA-4	0.027 ± 0.002	0.0087 ± 0.0009	0.0101 ± 0.0005	0.0029 ± 0.0002
NZA-5	0.016 ± 0.002***	0.0017 ± 0.001 0	0.0012 ± 0.0004	0.0095 ± 0.0004
NZA-6	0.0105 ± 0.0012***	0.0051 ± 0.0006	0.0809 ± 0.0021	0.0147 ± 0.0008
NZA-7	0.016 ± 0.002***	0.0116 ± 0.0010	0.0136 ± 0.0006	0.00020 ± 0.00007**

* Mean of 45 to 76 accepted results from 9 to 15 independent sets. The uncertainty estimate is the 95% confidence interval estimate for the mean.

** Mean of 27 to 30 accepted results from 6 independent sets.

*** Found to be significantly distributed between samples in disc form. At the 95% confidence level, at least 99% of the disc samples are expected to have iron concentrations in the range: 0% to 0.042% for alloy NZA-5, 0% to 0.027% for alloy NZA-6, and 0% to 0.040% for alloy NZA-7.

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