

Issue October 2019  
Valid to December 2019

# MBH

## Setting Up Samples

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**ARMI | MBH**  
ANALYTICAL LTD



**LGC and MBH**

In December 2018 MBH became a member of the LGC family alongside the ARMI brand of Reference Materials. We are now also able to offer direct access to the extensive ARMI range. Please see the ARMI/LGC catalogue also on our website for additional Reference Materials.

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**Please Note**

This catalogue details only the currently available Setting Up Samples from various producers and supplied by MBH Analytical Ltd. Please see the Reference Materials catalogues from MBH and ARMI for further calibration materials to Reference or Certified Reference Materials standard.

**Setting Up & Check Samples**

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This catalogue is not the full listing of the materials supplied by ARMI/MBH but only those setting up samples currently supplied by ARMI/MBH. Please also see our other catalogues.

On the following pages you will find the current range of setting up samples for optical emission spectroscopy (OES), supplied by ARMI/MBH. The range includes Setting Up Samples for both ferrous and non-ferrous alloys and sourced from several producers. These are offered here from ARMI/MBH for your convenience.

The format of the catalogue has followed the same conventions we use in our full Reference Materials catalogue. Whilst every effort has been made to detail the latest information, it is possible that products will be remade or replaced and values and dimensions changed. This catalogue can therefore only be a snapshot of the information available at the time of publication. These materials are not classified as Certified Reference Materials and therefore are often supplied with only a datasheet to present the compositional values.

A separate price list is available upon request. Please be aware that the producers may change availability and prices without notice. Please ask for our confirmation or quotation of the current prices before placing your order.

If you cannot find the catalogue reference number you want listed it may have been changed, deleted or excluded because of its age or availability. Please enquire, and we will investigate to see if it can be supplied.

**These materials are classified as Setting-Up Samples or Check Samples only. For materials to Reference or Certified Reference Material grade please see our other catalogues.**

## Information

### Abbreviations

( )	The concentration value stated within the brackets is not certified and is provided for information purposes only
R.E.	Rare Earth
ppm	Parts per Million (w/w)

### Form

C	Material is a <b>Cast</b> product
CC or (2xCC)	Material is <b>Chill Cast</b> product or ( <b>Double Chill Cast</b> )
HIP	Material is <b>Hot Isostatically Pressed</b> powder
SC	Material is a <b>Spray Cast</b> product
W	Material is a <b>Wrought</b> product
R	Material has been cut from <b>Rolled</b> strip

**All compositional values stated herein are approximate and will vary from melt to melt. Each piece is supplied with datasheet/certificate giving values for the melt supplied.**

Material listed in previous editions but now no longer listed herein should be considered no longer available and are not likely to be remade.

# 16. Setting Up Samples

Updated May 2019

Blocks / Discs

All of these samples have been prepared to meet the daily setting up requirements of laboratories using Direct Reading Spectrometers.  
Analytical Data are supplied with each sample but are not certified as accurate as these are not intended to be used as Primary Reference Materials, and should not be used for calibration..

16.1 Cast Iron		C	Si	Mn	P	S	Cr	Mo	Ni	Al	Cu	Sn	Ti	V	Nb	W	Zr	As	B	Bi	Sb	Mg	Ce	Size (mm)	Form	
																								Ø x H		
161U RG13		3.1	2.2	0.9	0.40	0.05	1.0	0.3	0.5	0.06	0.5	0.3	0.01	0.3	<0.01	0.02	...	...	...	...	...	...	...	...	40 x 25	C
161U RG13+Se		3.2	2.1	0.9	0.4	0.04	1.0	0.3	0.5	0.03	0.8	0.3	0.02	0.3	<0.01	0.01	Co = <0.01	Se = ~0.01	...	...	...	...	...	...	40 x 20	C
161U RG14		3.2	1.8	0.2	0.06	<0.01	1.0	...	1.2	0.05	0.06	0.2	<0.01	0.13	...	...	...	...	0.04	...	...	0.05	0.04	40 x 25	C	
161U RG15		2.1	3.7	0.8	0.3	0.1	0.6	0.8	0.5	0.03	0.007	0.1	...	...	...	...	...	...	...	...	...	...	...	40 x 25	C	
162U RG16		3.3	2.2	0.2	0.3	<0.01	1.1	...	0.9	0.05	0.08	0.2	0.03	0.2	...	...	...	...	0.02	...	...	0.05	0.03	40 x 25	C	
161 A 1/19		3.1	2.8	0.44	0.05	0.07	0.50	0.33	0.19	0.02	0.47	0.05	<0.005	0.04	...	...	...	...	...	...	...	...	...	60 x 35 x 18	CC	
161 A 2/48		3.6	1.9	0.70	0.17	0.13	0.07	0.10	0.48	<0.01	0.21	0.09	0.04	0.54	...	...	...	...	...	...	...	...	...	60 x 35 x 18	CC	
161 A 3/21		3.4	2.2	0.90	1.0	0.10	0.25	<0.005	0.01	<0.005	0.01	<0.005	0.11	0.27	...	...	...	...	...	...	...	...	...	60 x 35 x 18	CC	
161 A 4/28		3.3	2.7	0.17	...	0.01	0.09	...	0.10	0.02	0.75	<0.005	0.05	0.50	...	...	...	0.06	...	...	<0.005	0.03	0.09	60 x 35 x 18	CC	
161 A 5/56		3.8	2.0	0.61	...	0.008	0.02	...	1.0	0.04	0.009	0.07	<0.005	0.49	...	...	...	<0.005	...	...	0.03	0.09	0.03	60 x 35 x 18	CC	
161 A 6/6		2.5	1.8	0.65	0.05	0.12	0.10	...	...	<0.005	0.02	0.05	0.02	0.02	...	...	...	...	<0.001	0.01	...	...	...	60 x 35 x 18	CC	
161 A 7/8		2.8	0.94	0.29	0.09	0.18	0.07	...	...	0.02	0.21	<0.01	...	0.06	...	...	...	...	0.004	<0.001	...	...	...	60 x 35 x 18	CC	
161CS QCM SP-8B		2.4	1.4	0.86	0.022	0.012	37.6	0.10	2.72	0.13	0.075	0.06	0.13	0.13	0.04	0.05	...	0.05	0.03	...	...	...	...	37 x 25	W	
16.2 Low-Alloy Steels		C	Si	Mn	P	S	Cr	Mo	Ni	Al	Co	Cu	Nb	Sn	Ti	V	W	As	B	Zr	Ca	Sb	N	Size (mm)	Form	
																								Ø x H		
162U RE12		<0.003	<0.003	<0.01	<0.001	<0.002	<0.002	<0.001	<0.0015	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	...	<0.001	40 x 40	W	
162U RE13		0.010	<0.005	0.058	<0.01	<0.01	0.02	<0.01	0.015	<0.005	<0.003	0.009	0.002	0.002	<0.001	<0.001	<0.002	<0.003	<0.0002	<0.001	<0.0005	...	...	40 x 40	W	
162U RN13		0.99	0.02	1.92	<0.01	<0.01	<0.01	<0.01	3.03	0.38	<0.01	<0.01	<0.01	0.05	<0.001	<0.01	0.07	<0.01	<0.001	0.19	<0.001	0.04	<0.01	40 x 40	W	
162U RN14		0.02	1.6	0.06	0.09	0.07	3.0	0.5	0.04	0.01	0.6	0.6	>0.4	0.007	0.04	0.5	0.3	0.05	0.005	0.003	<0.001	0.001	0.03	40 x 40	W	
162U RN15		3	0.1	1.8	0.005	0.01	0.1	0.02	3	0.2	0.01	0.01	0.005	0.05	0.01	0.03	0.006	0.003	0.002	0.002	0.0003	0.04	...	40 x 40	W	
162U RN16		0.96	0.01	1.85	<0.01	<0.01	<0.01	<0.01	3.27	0.45	<0.01	<0.01	<0.01	0.05	<0.001	<0.01	0.09	<0.01	<0.001	0.20	<0.001	...	<0.01	40 x 40	W	
162U RN17		0.08	1.7	0.13	0.09	0.10	2.9	0.5	0.05	0.004	0.5	0.43	0.5	0.014	0.07	0.6	0.4	0.05	0.006	0.002	0.002	...	0.02	40 x 40	W	
162U RFeC		0.12	0.19	1.25	0.09	0.06	0.14	0.14	3.25	0.015	0.11	0.55	0.13	0.05	<0.01	0.75	0.47	0.05	0.001	<0.01	<0.01	0.01	0.01	40 x 40	W	
162U RFeD		0.85	1.05	0.22	0.02	0.01	2.93	1.22	0.12	0.16	0.32	0.05	0.30	<0.01	0.12	0.05	0.05	0.003	<0.01	0.13	<0.001	0.08	0.02	40 x 40	W	
162 A A/11		0.02	0.01	0.15	<0.005	0.005	0.02	0.01	0.05	0.07	0.01	0.01	<0.005	<0.005	<0.001	<0.005	<0.005	...	...	...	...	...	...	44 x 25/75/150	W	
162 A D/11		0.80	0.80	0.40	0.01	0.03	3.0	1.3	0.10	0.19	0.29	0.11	0.05	0.01	0.10	0.12	0.16	...	<0.001	...	...	...	0.01	44 x 25/75/150	W	
																								x3 stock lengths available - 25mm, 75mm & 150mm.		
162PZ IMZ-S07		0.18	1.7	0.23	0.06	0.1	2.1	0.12	2.0	...	0.02	0.17	...	...	0.02	0.15	2.3	...	...	...	...	...	...	45 x 30	C	
162DB SUS1-R		0.9	0.8	1.1	0.02	0.017	1.7	0.9	2.9	...	0.3	0.7	0.55	...	...	0.5	0.7	...	...	...	...	...	...	50 x 42	HIP	

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16.2 Low-Alloy Steels continued																					Size (mm)	Form	
	C	Si	Mn	P	S	Cr	Mo	Ni	Al	Co	Cu	Nb	Sn	Ti	V	W	As	B	Zr	Ca	N	Ø x H	
162CS QCM SP-5B	0.20	3.07	1.86	0.108	0.023	0.38	0.13	3.00	0.18	...	0.15	0.09	0.08	0.35	0.71	0.62	0.19	0.14	...	...	...	37 x 25	W
162CS QCM SP-6A	0.10	4.65	0.38	0.017	0.009	0.11	0.01	0.04	0.32	0.003	0.12	...	0.01	0.008	0.016	0.02	0.003	...	...	...	...	37 x 25	W
162CS QCM CM-2A	0.20	1.66	0.97	0.10	0.012	1.50	0.33	1.20	0.03	0.43	1.01	0.48	0.08	0.34	0.10	0.23	0.11	0.0005	0.03	...	...	37 x 25	w
162CS QCM CM-5B	1.09	0.39	1.28	0.021	0.012	2.07	0.10	0.23	0.083	0.022	0.13	0.015	0.012	0.02	0.06	0.03	0.018	0.002	0.09	...	0.0135	37 x 25	w
162CS QCM CM-10A	0.694	0.817	1.00	0.040	0.022	5.48	1.234	2.38	0.086	0.114	0.31	...	0.062	0.0189	0.908	0.96	0.03	0.05	...	...	...	37 x 25	w
162CS QCM CM-11A	0.031	3.50	0.25	0.014	0.009	0.044	0.008	0.027	0.082	0.003	0.30	...	0.008	0.005	...	...	0.003	...	...	...	0.008	37 x 25	w
162CS QCM CM-12A	0.031	3.21	0.17	0.013	0.011	0.067	0.008	0.03	0.098	0.003	0.173	...	0.007	0.005	...	...	0.003	...	...	...	0.007	37 x 25	w

1.6.3 High-Alloy Steels																					Size (mm)	Form	
	C	Si	Mn	P	S	Cr	Mo	Ni	Al	Co	Cu	Nb	Sn	Ti	V	W	As	B	Zr	Ca	N	Ø x H	
162 A F/6	0.02	0.53	0.61	0.02	<0.005	25.8	3.4	7.2	0.005	0.05	0.63	0.005	<0.005	<0.005	0.06	0.63	0.005	0.002	...	...	0.25	Continued below	
162 A G/8	0.03	0.32	1.7	0.03	0.02	16.8	2.1	10.0	0.003	0.15	0.30	0.01	0.006	<0.005	0.08	0.04	...	...	0.005	0.003	0.08		
162U RN18	1.5	0.6	1.3	...	0.2	...	...	11	0.08	...	7	...	0.2	...	...	...	...	...	plus Pb, Te, Bi			40 x 10	w
162U RN19	0.91	1.08	1.66	>0.12	0.09	3.04	0.88	3.18	0.70	>0.7	0.48	>0.4	0.10	0.10	0.62	0.45	0.07	<0.01	0.14	<0.001	0.03	40 x 40	w
162U RH12	0.40	0.66	17.56	0.04	<0.01	3.69	0.33	0.37	<0.01	<0.01	0.08	0.06	<0.01	<0.01	0.03	0.06	<0.01	...	<0.01	...	...	40 x 40	w
162U RH13	1	0.4	0.3	0.02	<0.01	3.7	4.7	0.3	0.02	4	0.10	0.02	0.01	0.003	1.6	6	...	...	...	...	...	40 x 40	w
162U RH18	1.36	0.38	0.30	0.03	0.03	4.22	3.54	0.23	<0.005	10.3	>0.09	0.02	0.005	0.003	3.15	8.87	...	...	...	...	...	40 x 40	w
162U RH30	0.06	0.4	1.4	0.01	0.01	17.5	2.2	11.9	0.02	0.05	0.1	0.6	0.004	0.01	0.07	0.05	<0.001	...	...	...	...	40 x 40	w
162U RH31	0.03	0.3	0.4	0.01	0.01	17	2	20			2	0.3										40 x 40	w
162U RH33	0.027	0.08	9.1	<0.01	0.02	17.7	0.01	19.6	0.035	0.022	2.25	0.37	<0.01	0.55	0.037	0.083	<0.001	...	0.015	...	...	40 x 40	w
162U RH34	0.058	0.22	7.2	<0.01	0.01	16.2	0.03	18.1	0.022	0.04	1.7	0.33	<0.01	0.02	0.05	0.11	<0.001	...	0.012	...	0.16	40 x 40	w

Continuation from above						Size (mm)	Form
	O	Pb	Sb	Fe	Ta	Ø x H	
162 A F/6	...	...	...	60.7	...	45 x 25/75/150	w
162 A G/8	...	...	...	...	<0.001	45 x 25/75/150	w

x3 stock lengths available - 25mm, 75mm & 150mm.

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## 1.6.3 High-Alloy Steels continued

	C	Si	Mn	P	S	Cr	Mo	Ni	Al	Co	Cu	Nb	Ti	V	W	As	B	Zr	N	Size (mm) Ø x H	Form
162PZ IMZ-S04	0.5	0.2	0.8	0.03	(0.2)	4.3	6.5	0.53	...	10.6	...	...	...	1.5	...	...	...	...	...	43 x 35	W
162PZ IMZ-S06	0.25	0.25	1.2	0.01	0.01	10.5	0.5	19.6	...	...	0.04	1.3	...	...	0.4	...	...	...	...	45 x 20	W
162PZ IMZ-S10	0.12	0.32	0.65	0.01	0.01	28	...	1.1	...	...	2.4	0.6	1.4	...	...	...	...	...	...	45 x 30	W
162PZ IMZ-S13	0.14	0.6	0.6	0.01	0.01	10.8	0.8	1.1	...	...	0.05	0.45	0.02	0.7	0.9	...	...	...	...	40 x 23	W
162PZ IMZ-S16	0.10	1.3	0.65	0.015	0.01	14.3	...	0.59	0.5	...	0.12	...	0.20	...	...	...	...	0.01	...	40 x 30	W
162PZ IMZ-S21	0.26	0.44	0.50	0.02	0.02	18.3	0.4	2.2	...	...	0.30	...	0.12	0.25	0.4	...	...	...	...	40 x 30	W
162PZ IMZ-S22	1.1	0.94	1.1	0.01	0.02	19.1	...	0.63	...	0.02	0.03	...	0.02	0.033	...	0.002	0.001	...	...	45 x 23	W
162PZ IMZ-S27	0.23	2.0	1.7	0.02	0.01	15.5	...	35	...	...	...	...	...	...	...	...	...	...	...	40 x 20	W
162PZ IMZ-S28	0.03	0.75	1.6	0.01	0.01	16.3	2.25	14.3	...	...	...	...	...	...	...	...	0.005	0.005	...	40 x 30	W
162PZ IMZ-S34	0.11	0.62	1.7	0.015	0.01	20.8	1.6	9.1	...	...	...	...	0.5	...	0.5	...	...	...	...	40 x 30	W
162PZ IMZ-S36	0.06	0.9	2.0	0.01	0.01	25.5	3.1	29.0	...	0.03	3.0	...	0.8	0.05	...	...	...	...	...	40 x 35	W
162PZ IMZ-S504	0.03	0.56	1.43	0.02	0.01	18.2	...	11.1	...	...	...	...	...	...	...	...	...	...	0.17	50 x 23	W

## 1.6.3 High-Alloy Steels

	C	Si	Mn	P	S	Cr	Mo	Ni	Al	Co	Cu	Nb	Sn	Ti	V	W	As	B	N	Size (mm) Ø x H	Form
162CS QCM SL-1A	0.078	1.39	0.46	0.024	0.011	13.4	0.03	0.23	0.86	0.02	0.09	...	0.01	0.004	0.017	0.1	...	...	0.025	37 x 25	W
162CS QCM SL-2A	0.015	0.64	1.84	0.025	0.027	16.9	2.03	11.0	0.005	0.09	0.50	...	0.01	0.06	0.075	0.03	0.008	0.002	0.04	37 x 25	W
162CS QCM SL-3A	0.043	0.53	1.73	0.024	0.002	24.6	0.38	19.6	0.007	0.06	0.22	0.013	0.006	0.003	0.066	0.03	...	0.002	0.065	37 x 25	W
162CS QCM SL-4A	1.38	2.28	2.85	0.038	0.017	26.3	0.92	2.04	0.12	0.11	0.75	1.11	0.02	0.8	0.54	0.35	...	0.0013	...	37 x 25	W
162CS QCM SL-5A	0.37	0.36	5.8	0.021	0.014	11.7	4.12	4.94	0.035	0.26	2.90	0.20	0.004	0.004	0.21	0.78	0.005	...	...	37 x 25	W
162CS QCM SL-6A	0.17	0.23	0.24	0.015	0.029	6.8	0.13	32.3	0.26	0.69	0.22	0.36	0.006	1.8	0.15	1.74	0.004	...	...	37 x 25	W
162CS QCM SP-1A	0.047	0.33	1.87	0.024	0.26	17.7	0.42	8.6	0.004	0.095	0.52	0.012	0.01	0.02	0.058	0.03	0.006	0.0007	...	37 x 25	W
162CS QCM SP-3B	0.27	0.72	0.29	0.023	0.008	15.1	0.24	5.65	0.08	0.02	0.62	...	0.01	0.13	0.10	0.12	...	0.88	...	37 x 25	W
162CS QCM SP-4B	0.31	1.51	1.36	0.027	0.008	20.8	0.02	35.8	0.025	0.135	0.04	...	...	...	...	...	...	...	...	37 x 25	W
162CS QCM HS-1A	0.72	0.28	0.28	0.023	0.011	4.15	0.06	0.14	0.03	4.7	0.08	...	0.02	0.003	1.33	17.5	...	...	...	37 x 25	W
162CS QCM HS-2A	1.24	0.24	0.27	0.024	0.017	4.15	3.75	0.21	0.035	9.9	0.08	...	0.01	0.003	3.4	9.3	...	...	...	37 x 25	W
162CS QCM SP-7A	0.006	0.036	0.08	0.007	0.010	0.01	0.01	47.3	0.003	0.003	0.08	...	...	0.004	0.001	...	...	...	...	37 x 25	W

# 16. Setting Up Samples

Updated May 2019

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16.4.1 Pure Aluminium	All values ppm																				Size (mm) Ø x H	Form	
	Cu	Mg	Si	Fe	Mn	Ni	Zn	Pb	Sn	Ti	Cr	B	Be	Bi	Ca	Cd	Co	Ga	Li	Na			P
164MI 220 G	(27)	(9)	(14)	(21)	(2)	(0.6)	(3)	(0.15)	<(0.01)	<(20)	(0.3)	(5.7)	<(0.1)	<(0.1)	(0.1)	<(0.1)	<(0.1)	(1.4)	<(0.1)	(0.30)	(6)	57 x 38	W
164V E0	<0.1	<<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	...	60 x 40	W
164V E1	<4	<3	<5	<3	<0.5	<0.5	<2	<0.5	<0.2	<1	<0.5	<2	<0.1	<0.5	<1	<0.2	<0.1	<0.2	<0.1	<1	...	60x25/40/75	W
164V E10	<4	<3	<10	<5	<1	<1	<3	<K2	<3	<1	<1	<2	<0.2	<3	<1	<1	<1	<1	<0.2	<1	...	60 x 25/40	W
164ZA RC10/01	2	<3	<20	10	<2	<2	<5	<2	<2	<2	<2	<2	<1	<2	<1	<2	<2	<2	<1	<1	10	60 x 35	concast
164U RA10	<10	<10	<30	<10	<10	<20	<10	<10	<10	<10	<10	<5	<1	<20	<5	<10	<10	<10	<10	<1	...	50 x 50	HIP
164HY AL4N	25	15	13	16	2	0.4	3	1	0.5	0.6	0.6	0.6	0.1	0.1	0.2	1	...	0.5	0.2	1	...	50 x 35	C

\*Where several different lengths are offered the price stated refers to the smallest. For other lengths please enquire.

16.4.2 Low-Alloy Aluminium	All values %																				Size (mm) Ø x H	Form	
	Cu	Mg	Si	Fe	Mn	Ni	Zn	Pb	Sn	Ti	Cr	V	Be	Ca	Sb	Co	Ga	Ag	Na	Sr			Zr
164V E8	0.02	0.005	0.012	0.017	0.006	0.004	0.005	0.003	0.004	0.004	0.005	0.003	0.001	0.003	0.008	0.003	0.006	0.005	...	0.002	0.004	60x25/40/75	W
164V E2	0.2	0.2	0.9	0.9	0.2	0.2	0.1	0.1	0.2	0.2	0.05	0.11	0.004	0.008	...	0.04	0.06	0.22	0.008	0.11	...	60x25/40	W
164ZA RC11/05	0.016	0.016	0.023	0.046	0.016	0.010	0.020	0.015	0.017	0.015	0.014	0.017	0.002	0.003	0.013	0.012	0.021	0.010	0.003	0.007	0.016	65 x 35	concast

\*Where several different lengths are offered the price stated refers to the smallest. For other lengths please enquire.

16.4.2 Aluminium																				Size (mm) Ø x H	Form
	Cu	Mg	Si	Fe	Mn	Ni	Zn	Pb	Sn	Ti	Cr	Co	Be	Sb	Ca	Sr	Zr	Ag			
164X ALSUS7	4	0.15	0.9	0.55	0.06	1.1	0.12	0.11	0.01	0.3	0.01	0.2	0.1	0.12	<0.001	0.003	0.18	...	50 x 25	C	
164X ALSUS8	0.75	0.9	9.5	0.25	0.45	0.12	0.25	0.001	0.13	0.02	0.06	0.025	0.015	0.03	<0.001	0.07	0.025	0.09	50 x 25	C	

16.4.3 High-Alloy Aluminium																					Size (mm) Ø x H	Form	
	Cu	Mg	Si	Fe	Mn	Ni	Zn	Pb	Zr	Ti	Cr	Be	Ca	Bi	Sb	Co	Ga	B	Li	Ag			Cd
164MI 221	0.6	4.8	0.2	0.2	0.4	...	6.7	...	...	0.1	0.2	0.005	0.03	...	0.01	0.2	0.03	...	...	...	...	38 x 19	W
164V E3	4.0	...	10.0	...	...	1.0	...	0.4	...	...	...	...	0.009	...	0.3	...	...	0.01	0.007	...	...	60 x 25/40/75	W
164V E4	...	1.1	...	...	0.7	...	5.2	...	0.2	...	0.2	...	...	0.2	...	0.4	...	...	...	0.2	0.06	60 x 25/40/75	W
164V E5	...	4.6	...	...	1.3	...	...	...	...	...	...	...	...	...	...	...	...	...	0.01	...	...	60 x 25/40/75	W
164V E13	...	...	...	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	60 x 25/40/75	W

\*Where several different lengths are offered the price stated refers to the smallest. For other lengths please enquire.

# 16. Setting Up Samples

Updated August 2019

Blocks / Discs

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## 16.4.3 High-Alloy Aluminium

	Cu	Mg	Si	Fe	Mn	Ni	Zn	Pb	Zr	Ti	Cr	Be	Ca	Bi	Sb	Co	Ga	B	Li	Ag	Cd	Size (mm) Ø x H	Form
164ZA RC20/02	6.0	0.3	0.03	0.06	0.25	1.5	0.25	0.4	0.15	...	...	...	...	0.4	0.2	0.45	...	...	...	0.75	0.035	60 x 35	concast
164ZA RC40/02	1.0	1.1	13	1.2	...	...	6.0	0.1	...	0.2	...	...	0.013	...	...	...	...	...	...	...	...	60 x 35	concast
164ZA RC41/01	5.0	0.1	6.0	0.4	0.5	0.02	1.3	0.02	0.005	0.03	0.03	...	0.004	...	...	...	0.01	...	...	...	0.001	60 x 25	concast
164ZA RC50/02	0.003	4.5	0.5	0.85	0.005	0.5	0.02	...	0.01	...	0.5	0.005	0.02	...	0.05	...	0.03	0.005	0.003	...	0.2	65 x 35	concast
164ZA RC60/02	0.3	0.9	1.3	0.5	1.1	0.1	0.1	...	...	0.2	0.2	...	...	0.1	...	...	0.01	...	...	...	...	60 x 35	concast
164U RA16	3.5	0.2	14	0.3	<0.01	2.8	0.3	0.1	0.002	<0.001	0.005	<0.001	0.005	<0.01	0.1	<0.01	0.005	0.006	<0.001	<0.001	<0.01	Continued below	
164U RA18	8.2	0.17	16.5	0.45	0.35	2.9	0.27	0.3	<0.005	<0.001	0.007	<0.001	0.01	<0.001	0.15	0.003	<0.001	0.005	<0.001	<0.001	0.001	50 x 50	W
164U RA19	0.5	7.7	1.0	1.2	1.1	0.6	7.8	<0.01	0.1	0.2	0.2	0.007	0.002	0.2	...	0.35	0.07	0.002	0.01	0.2	0.03	50 x 50	W
164U RA20	5.2	1	13.5	0.7	0.25	2.7	0.17	0.1	0.09	0.05	0.09	<0.0001	0.005	...	0.008	0.017	...	0.0007	0.001	...	...	50 x 50	W
164HY AMS-1	0.6	1.3	1.2	0.8	0.5	0.02	0.4	0.05	...	0.2	0.2	0.002	0.01	0.01	0.02	...	0.01	0.004	0.01	...	0.03	45 x 35	C
164HY ASC-1	6.0	1.2	14.0	1.6	0.4	0.6	0.5	0.1	0.01	0.5	0.2	0.003	0.02	0.1	0.02	...	0.04	...	...	...	0.05	45 x 35	C

Continuation  
from above

	V	Sn	Na	Sr	P	In	Size (mm) Ø x H	Form
164U RA16	<0.001	0.1	0.003	<0.01	0.01	<0.001	50 x 50	W

## 16.4.4 Aluminium Manganese Alloy

	Mn	Size (mm) Ø x H	Form
164U RAIMn12	(12)	38 x 42	C



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Updated May 2019

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16.5.1 Copper with Impurities																					Size (mm)	Form		
	Zn	Pb	Sn	P	Mn	Fe	Ni	Si	Mg	Cr	Te	As	Se	Sb	Cd	Bi	Ag	Co	S	O	Cu	Ø x H		
165U RC11	<0.0005	<0.001	<0.003	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0001	<0.0005	<0.001	<0.001	<0.0001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.001	99.98	40 x 40	W	
165U RC110	0.005	0.003	0.006	0.003	0.004	0.005	0.002	0.003	0.002	0.004	0.007	0.001	0.005	0.006	0.003	0.004	0.005	0.003	0.004	...	...	40 x 40	W	
165U RC20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.038	99.9	40 x 40	W

  

16.5.1 Pure Copper																					Size (mm)	Form	
All Elements ppm																					Ø x H		
	Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	Sb	P	S	Cr	Co	Ag	Mg	C	Se	O	N	Ø x H	
165X CUSUS1	0.7	44	0.4	8	4	0.05	0.05	0.05	0.04	0.05	0.4	4	44	0.04	0.4	0.05	0.04	(0.5)	0.05	(370)	(6)	50x45	W
Sold Out																							

  

16.5.2 Low-Alloy Copper																					Size (mm)	Form	
	Zn	Pb	Sn	P	Mn	Fe	Ni	Si	Mg	Cr	Te	As	Se	Sb	Cd	Bi	Ag	Co	Al	S	Au	Ø x H	
165U RC12	0.45	0.09	0.2	0.09	0.04	0.1	0.07	0.06	0.002	0.04	0.04	0.04	0.02	0.04	0.05	0.01	0.05	0.05	0.09	0.04	0.006	40 x 40	W
165U RC14	<0.001	<0.01	<0.01	...	<0.01	<0.01	<0.01	<0.02	...	0.8	...	<0.01	...	...	...	<0.01	...	...	<0.01	<0.01	...	40 x 40	W

  

																					Size (mm)	Form
	Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	Sb	P	S	Cr	Co	Mg	Se	Cu			Ø x H	
165X MNB5 SUS	1.6	0.20	38	0.55	1.1	3.2	0.40	...	0.20	...	...	...	...	...	...	...	...	55			40 x 17	CC
165X PB10 SUS	11.0	0.04	0.05	0.002	0.06	0.001	0.001	0.02	<0.001	0.02	0.15	0.002	0.03	0.001	0.01	...	0.01	89			42 x 18	CC
165X ALB1 SUS	0.03	0.20	0.06	2.8	5.3	9.0	0.10	0.005	0.08	0.015	...	0.015	...	0.01	...	0.04	...	82			40 x 18	CC

  

16.5.3 High-Alloy Copper																					Size (mm)	Form	
	Zn	Pb	Sn	P	Mn	Fe	Ni	Si	Mg	Cr	As	Sb	Cd	Bi	Ag	Co	Al	S	Cu			Ø x H	
165U RC32	35.6	0.47	0.40	0.01	1.82	0.25	0.16	0.62	...	<0.01	0.004	...	<0.005	<0.01	0.006	...	1.92	...	58.7			40 x 40	W
165U RC33	0.18	<0.01	0.03	<0.01	0.3	3.8	4.1	0.08	<0.001	0.005	0.02	<0.001	<0.005	0.004	<0.001	0.04	10.0	0.002	81.4			40 x 40	W
165U RC36	0.46	12.42	7.41	<0.01	<0.01	<0.01	1.56	<0.01	<0.001	<0.001	0.02	0.20	<0.001	0.02	0.03	0.001	<0.01	0.03	77.9			40 x 40	W
165U RC38	<0.01	<0.01	<0.01	<0.01	0.90	0.74	31.3	0.02	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	66.7			40 x 40	W
165U RC40	<0.01	0.05	0.04	<0.01	5	1.6	2	0.02	<0.01	<0.01	<0.01	...	...	...	...	...	8	...	...			40 x 40	W

# 16. Setting Up Samples

Updated August 2019

Blocks / Discs

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16.6 Magnesium		Al	Si	Mn	Cu	Fe	Zn	Ni	Pb	Sn	Zr	Cd	Na	Ce	La	Y	Nd	Pr	Mg	Size (mm) Ø x H	Form	
166U RMg11		0.022	0.029	0.027	<0.003	<0.003	<0.005	<0.005	...	...	...	...	...	...	...	...	...	...	...	99.9	50 x 40	C
166U RMg13		6.0	0.02	0.2	<0.002	<0.005	0.9	<0.002	<0.002	<0.002	<0.01	<0.001	0.001	...	...	...	...	...	...	50 x 40	C	
166U RMg14		8	0.8	(0.4)	0.3	0.008	1	0.04	...	0.09	<0.001	<0.01	<0.01	...	...	...	...	...	...	50 x 40	C	
166U RMg16		...	...	...	...	0.01	...	...	...	...	0.06	...	...	2.2	1	2.2	1.6	0.26	...	50 x 50	C	

  

		Al	Zn	Mn	Cu	Si	Fe	Ni	Ti	Sn	Pb	Ag	Be	Cd	Size (mm) Ø x H	Form	
166X MGSUS3		0.4	0.09	0.8	0.07	0.01	<0.005	0.02	...	0.005	0.04	0.02	0.0005	0.005	50 x 15	C	
166X MGSUS4		9	5	0.12	0.2	0.015	0.02	0.003	0.005	0.05	0.02	1.6	0.003	0.04	Sold Out	50x15	E

  

16.7 Nickel		C	Si	S	P	Mn	Fe	Cr	Mo	Cu	Co	Nb	V	W	Al	Ti	Mg	Ta	Zr	B	Ni	Size (mm) Ø x H	Form	
167U RNi10		<0.005	<0.005	<0.001	...	...	<0.02	...	...	<0.001	<0.001	...	...	...	<0.001	...	...	...	...	...	...	>99.9	40 x 40	C
167U RNi11		0.02	0.18	<0.01	<0.01	0.27	0.06	<0.01	...	...	0.05	...	...	...	<0.01	<0.01	0.02	...	...	...	...	99.4	40 x 40	C
167U RNi12		0.12	0.17	<0.01	<0.01	0.74	1.0	0.12	...	29.0	<0.01	...	...	...	3.2	0.51	...	<0.01	...	...	...	65.0	40 x 40	C
167U RNi13		0.01	0.04	<0.01	<0.01	0.5	6.1	15.3	16.3	0.006	0.04	0.02	...	...	0.28	0.12	...	<0.01	...	...	...	57.2	40 x 40	C
167U RNi14		0.06	0.10	<0.01	<0.01	0.44	0.54	19.89	6.25	0.018	19.9	0.05	<0.01	0.09	0.6	2.03	...	...	<0.01	0.003	...	50.0	40 x 40	C
167U RNi15		0.03	0.08	<0.01	<0.01	0.05	19.5	18.4	3.0	0.02	0.06	4.5	0.05	0.13	0.5	1.0	...	<0.001	0.02	0.003	...	52.8	40 x 40	C
167U RNi17		0.31	0.43	<0.01	<0.01	0.24	18	0.8	0.2	0.3	0.2	0.2	0.06	10	0.01	-4	...	0.02	0.02	...	(Bal)	40 x 30	C	

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16.8 Lead	Sn	Sb	Bi	Cu	As	Ag	Fe	Zn	Cd	In	Ni	Te	Se	Tl	Au	S	Hg	Size (mm) Ø x H	Form
168X PBSUS1	1.3	6.2	0.04	0.03	0.37	0.01	0.002	0.001	0.015	0.01	0.003	0.01	0.01	0.001	0.001	0.002	...	45 x 30	C
168X PBSUS5	0.9	0.35	0.35	0.06	0.35	0.2	<0.001	...	0.09	0.08	0.001	0.003	...	0.002	0.0005	0.0005	0.02	50 x 25	C
168X PBSUS6	0.15	0.12	0.22	0.10	0.025	0.04	<0.001	0.002	0.015	0.01	0.003	0.0005	0.003	0.03	0.001	0.0005	...	45 x 35	C

16.8.1 Lead for fire assay	ppm Pt	ppm Pd	ppm Au	ppm Rh	ppm Ru	ppm Ir	ppm Ag	ppm Fe	ppm Bi	ppm Cu	ppm Ni	ppm Te	ppm As	ppm Sb	ppm Tl	ppm S	ppm Au	% Pb	Size (mm) Ø x H	Form	
168X PBSUS PM4	55	20	35	42	0.4	2	40	4	400	5	3	4	2	4	40	2	...	...	Sold Out	48 x 28	C
168U RPBPM*	50	50	...	50	5	...	100	...	...	...	...	...	...	...	...	...	100	99.9%		40 x 40	W

\* all values stated in ppm except Zn and are target values. Please see the current batch datasheet for actual values.

16.8 Lead	Sn	Sb	Bi	Cu	As	Cd	Ni	Ag	Tl	Fe	Zn	S	Se	Te	Ca	Ba	Au	Pd	Ge	Pt	Al	Na	Pb	Size (mm) Ø x H	Form
168U RPB11*	<1	<1	30	<1	<10	<1	<1	<10	3	<20	<5	...	...	...	...	...	...	...	...	...			99.99%	40 x 40	C
168U RPB13	0.03	0.08	0.25	0.1	0.04	0.025		0.03	0.03		0.01	...	0.005	0.01	...	...	...	...	...	...			99	40 x 40	C
168U RPB14	0.005	10.0	0.01	0.06	1.2	0.002		0.005			<0.003	0.01	...		...	...	...	...	...	...			88	40 x 40	C
168U RPB15	30.0	2.0	0.1	1.5	0.02	0.01	0.003	3.0	0.01	0.005	0.1	...	0.01	0.01	...	...	...	...	...	...			64	40 x 40	C
168U RPB16	0.18							<0.001			<0.001		...		0.2	0.01	...	...	...	...	0.05	0.005	97	40 x 40	C
168U RPB17	3.6	9.9	0.1	1.5	0.3		0.001	2.0	0.002	0.007	<0.001		...	0.003	...	...	0.001	0.001	0.001	0.001			83	40 x 40	C
168U RPB18	0.02	1.9	3.0	0.06	4.0	0.03		0.09	0.02				0.01	0.01	...	...	...	...	...	...			90	40 x 40	C

16.8 Lead	Zn	P	Bi	Au	In	Cd	Sn	Size (mm) Ø x H	Form
168U RPB19	0.6	<0.01	28	0.01	0.3	0.2	4.8	40 x 30	C

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Updated June 2019

Blocks / Discs

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16.9 Zinc		Pb	Mg	Al	Cd	Fe	Sn	Cu	Ni	Mn	Bi	Sb	Ti	Tl	In	Ag	Cr	Si	Zn	Size (mm) Ø x H	Form			
169U RZn11*		<5	<1	<5	,5	<10	<5	<5	<5	...	...	...	<1	...	...	...	...	...	99.99%	Hi Purity	40 x 40	C		
169U RZn12*		70	20	50	80	60	60	70	40	7	(0.01)	20	40	80	70	60	...	...	99.9%	Unalloyed	40 x 40	C		
* all values stated in ppm except Zn and are target values. Please see the current batch datasheet for actual values.																								
169U RZn13		0.6	<0.01	0.3	0.3	0.02	0.3	0.3	0.05	<0.01	...	0.2	<0.01	0.02	0.3	0.05	...	...	99	Smelter Zinc	40 x 40	C		
169U RZn14		0.03	0.08	10.0	0.02	0.05	0.02	4.0	0.004	0.015	...	<0.01	0.03	...	<0.01	0.007	...	...	85.7	Zamak	40 x 40	C		
169U RZn15		0.15	...	0.20	0.5	0.2	0.05	0.3	...	0.01	...	0.02	...	...	...	...	...	...	98.2	-	40 x 40	C		
169U RZn16		0.1	...	0.20	0.01	0.1	0.005	0.005	...	...	...	...	...	...	...	...	...	...	99	-	40 x 40	C		
169X ZnSUS1		0.60	0.002	0.35	0.30	0.05	0.30	0.35	0.06	0.001	0.005	0.20	0.001	0.06	0.25	0.04	0.001	0.003	...		50 x 20	C		
All values are current batch actuals.																								
16.10 Titanium		Fe	C	Pd	Al	V	Mo	Zr	Sn	Ti											Size (mm) Ø x H	Form		
1610U RTi11		0.2	0.06	...	...	...	...	...	...	99.6											40 x 40	C		
1610U RTi12		0.2	0.06	0.2	...	...	...	...	...	99.4											40 x 40	C		
1610U RTi13		0.05	0.08	...	6.0	4.0	...	...	...	90											40 x 40	W		
1610U RTi14		0.01	0.02	...	(6)	...	2	4	2	85											40 x 40	W		
Pure Ti/Pd Ti Al6/V4 Ti Al/Mo/Zr/Sn																								
16.11 Tin		As	Bi	Sb	Pb	Cu	Fe	Cd	Zn	Ni	Al	Ag	Co	In	Tl	P	Au	Ge	Sn	Se	Te	Size (mm) Ø x H	Form	
1611U RSn10*		<10	<5	<30	<10	<10	<1	<5	<5	<5	<5	<1	...	<1	<5	<10	...	...	99.99%	...	...	Hi Purity	40 x 40	C
* all values stated in ppm except Sn and are target values. Please see the current batch datasheet for actual values.																								
1611U RSn11		<0.002	<0.001	<0.003	<0.002	<0.003	<0.001	...	<0.001	...	...	...	...	...	...	...	...	...	99.9	...	...	Pure	40 x 40	C
1611U RSn12		0.25	0.09	2.0	38.0	0.95	<0.01	0.1	0.01	<0.01	<0.0005	0.2	<0.01	0.15	0.02	...	...	...	58	...	...		40 x 40	C
1611U RSn13		<0.01	0.04	15.0	1.0	0.2	0.2	0.01	0.03	0.20	0.05	<0.01	0.08	<0.01	<0.001	...	...	...	83	...	...		40 x 40	C
1611U RSn14		...	40	...	...	...	...	12	...	...	...	...	...	...	...	0.05	...	...	45	...	...		40 x 40	C
1611U RSn15		...	0.3	8	...	7.5	0.08	...	0.04	0.03	0.04	3.0	...	...	...	...	0.01	0.4	81.6	...	...		40 x 40	C
1611U RSn20		0.004	10	0.02	0.06	0.01	...	0.01	25	...	...	...	...	7.7	...	0.01	...	...	57.2	...	...		40 x 40	C
1611U RSn21		0.004	0.1	0.06	0.09	0.4	0.2	...	0.3	0.4	0.05	10	0.1	0.1	...	...	...	0.1	88.1	...	...		40 x 40	C
1611X SNSUS6		0.3	0.08	0.15	1.0	0.4	0.03	0.01	0.005	0.03	...	0.1	0.02	0.005	0.005	...	0.001	...	...	0.003	0.001		50 x 20	C
1611X SNSUS7		2.1	2.3	9	0.35	11	(0.05)	0.03	0.005	0.05	<0.001	0.3	0.005	0.03	0.03	...	0.005	...	...	0.005	0.003		50 x 20	C
All values are current batch actuals.																								

# 16. Setting Up Samples

Updated May 2019

Blocks / Discs

Analytical Data are supplied with each sample but are not certified as accurate as these are not intended to be used as Primary Reference Materials, and should not be used for calibration.

16.12 Cobalt	C	Si	Mn	P	S	Cr	Ni	Fe	Mo	Cu	Nb	V	W	Al	Ti	Zr	B	Ta	Sn	Pb	Size (mm) Form Ø x H
1612U RCo11	<0.02	<0.005	<0.001	<0.005	...	<0.005	<0.005	<0.01	<0.005	<0.001	<0.005	<0.001	<0.02	<0.05	<0.001	<0.003	...	...	...	...	35 x 20 C
1612U RCo14	0.35	0.49	0.35	<0.01	<0.01	28.3	10.3	0.9	...	...	...	<0.01	6.7	0.04	...	...	0.03	...	...	...	35 x 25 C
1612U RCo15	1	1.5	<0.01	0.03	0.03	0.11	0.09	24.8	8	2	2	0.02	0.04	0.05	<0.01	...	0.10	0.06	...	...	35 x 25 C
1612U RCo16	1.25	1.0	<0.01	<0.01	<0.01	0.06	0.03	0.26	3.5	2.7	2.2	0.98	0.01	0.2	0.1	...	0.07	0.08	...	...	35 x 25 C

# 16B. Check Samples

Updated August 2019

Blocks / Discs

16.20 Cast Iron & Steel	C	Si	Mn	P	S	Cr	Mo	Ni	Al	Co	Cu	Nb	Ti	V	W	Pb	Sn	As	Zr	B	N	Size (mm) Form Ø x H
1620U CFe1	0.008	0.016	0.068	0.006	0.005	0.027	0.0016	0.022	<0.002	0.0029	0.015	<0.0005	<0.0005	<0.0005	<0.0001	<0.0001	<0.002	0.002	<0.0001	<0.0004	0.0027	40 x 30/50 W
1620U CFe2	0.296	0.45	0.69	0.042	0.013	0.59	0.31	0.83	0.015	0.053	0.36	...	0.045	0.33	0.038	...	0.033	0.045	...	0.0015	0.0197	40 x 30/50 W
1620U CFe3	0.046	0.44	1.59	0.026	0.022	17.95	2.10	10.22	<0.02	0.34	0.26	0.50	0.02	0.10	0.05	...	0.02	...	<0.02	...	0.084	40 x 30/50 W
1620U CFe4	1.49	0.33	0.39	0.015	0.012	10.82	0.78	0.28	<0.02	0.01	0.06	<0.02	<0.002	0.6	<0.02	...	<0.02	...	...	<0.002	0.043	40 x 30/50 W
1620U CFe5	4.23	0.47	0.2	0.07	0.03	0.06	0.008	0.05	0.02	...	0.02	<0.002	0.04	0.07	...	...	...	...	...	...	...	40 x 30 W
1620U CFe6	3.3	2.8	0.4	0.04	0.04	0.06	<0.01	0.05	0.003	...	0.1	...	0.01	0.01	...	...	0.004	...	...	...	...	40 x 30/50 W
1620U CFe7	3.8	2.53	0.18	0.021	0.024	0.03	<0.01	0.01	<0.01	...	0.24	...	0.009	0.008	...	<0.001	0.003	...	...	...	Mg 0.056	40 x 30/50 W
1620U CFe8	3.3	1.24	0.49	0.025	0.03	0.06	0.01	0.11	0.05	0.006	0.065	<0.001	0.04	0.05	<0.01	...	0.01	...	...	...	...	40 x 30 W
1620U CFe9	0.09	0.001	1.2	0.06	0.3	0.01	0.005	0.01	0.0005	0.003	0.006	...	...	...	...	0.3	...	...	...	...	...	40 x 30/50 W
1620U CFe0	FeSi check sample used to check the quality of the argon in the discharge zone, by comparison of intensities against pure iron sample 162U RE12																				40 x 30/50 C	

\*Where several different lengths are offered the price stated refers to the smaller. For other lengths please enquire.

16.40 Aluminium	Al	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Pb	Sb	Sn	Ga	B	Ca	P	Size (mm) Form Ø x H
1640U CAI2	97	1	0.22	0.075	0.69	0.54	0.005	<0.005	<0.01	0.037	<0.005	<0.005	<0.005	0.009	<0.001	...	...	50 x 30/50 W
1640U CAI3	96	0.08	0.17	0.004	0.215	2.8	0.001	0.002	0.007	0.009	0.002	...	0.002	0.011	...	...	...	50 x 30/50 W
1640U CAI4	75	18	5	0.01	0.03	<0.001	...	1.9	<0.01	...	<0.01	...	...	...	0.0008	0.009	...	50 x 30/50 W
1640U CAI5	85.3	8.8	0.7	1.4	0.08	1.9	0.08	1.3	0.24	0.09	0.07	...	0.07	...	0.0010	...	0.0050	50 x 30/50 W
1640U CAI0	AlSi check sample used to check the quality of the argon in the discharge zone, by comparison of intensities against pure aluminium sample 164U RA10																	50 x 30/50 HIP

\*Where several different lengths are offered the price stated refers to the smaller. For other lengths please enquire.

16.60 Magnesium	Al	Si	Fe	Cu	Mn	Zn	Ni	Pb	Sn	Zr	Cd	Na	Mg	Size (mm) Form Ø x H
1660U CMg2	5.7	0.01	0.001	0.006	0.2	0.8	0.001	0.001	0.001	0.004	0.0001	0.001	(bal)	50 x 30/50 C

\*Where several different lengths are offered the price stated refers to the smaller. For other lengths please enquire.

16.11 Tin	Ag	Cu	Cd	Pb	Size (mm) Form Ø x H
1611X SAC305	2.9	0.50	0.35	0.12	~40 x ~6 C

Prepared primarily as an XRF Monitor sample for routine spectrometer calibration checks.

## Definitions

The materials found in this ARMI/MBH catalogue have been categorised as Setting Up Samples and Check or Control Samples. The following definitions used in ISO Guide 30: 2015 apply to the materials supplied by MBH Analytical Ltd.;

Certified Reference Material	"reference material (RM) characterized by a metrologically valid procedure for one or more specified properties, accompanied by an RM certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability".
Reference Material	"material, sufficiently homogeneous and stable with respect to one or more specified properties, which has been established to be fit for its intended use in a measurement process".
<b>Setting Up Samples</b>	Samples which have been prepared to meet the routine setting up requirements of laboratories using direct reading spectrometers. Whilst analytical data are supplied with each sample they are not certified and are only intended to be used as Setting Up Samples.
<b>Check/Control Samples</b>	Similar to Setting Up Sample (see above) but usually of a composition close to the 'working' composition of the users own product, and for regular checking of the operational or working range of the customers spectrometer.

## Use of Reference Materials

Whilst modern instrumental methods of analysis are capable of high accuracy and precision, they are comparative techniques. Setting Up Samples should be selected and used correctly for optimum performance to be achieved, and the following point should be considered;

The instrument manufacturer's recommendations and advice should be sought/ followed.

Users should be aware of the possible effects of structure, sample preparation and physico-chemical interferences when using these materials.

## Validity of Information

### **IMPORTANT - Please Note**

The majority of the analytical data in the preceding pages indicate actual values for the batch currently available. However some materials may be remade during the lifetime of this catalogue and the values achieved for the replacements may differ from those stated.

We recommend that customers verify the availability of any material where it is important that the material supplied has the element concentration values listed.

**All concentration values in this catalogue are given in % (w/w) unless otherwise stated.**

All stated dimensions and weights are approximate. Finished sizes/weights and composition may differ from those stated.

Whilst every effort is taken to present accurate data, errors and omissions excepted, it remains the responsibility of the purchaser to verify data prior to purchase and use.

## General Conditions

All materials are subject to our general Conditions of Sale. Copy available upon request .

- 1 All items listed in this catalogue or otherwise offered for sale are subject to availability and any delivery dates that may be quoted are conditional on supplies. We are unable to accept liability for delay and if any item becomes unavailable during the life of a catalogue we will advise on suitable alternatives where appropriate.
- 2 Unless credit facilities have been agreed with us (in which case payment is due on a net monthly basis), payment for items is due against a Pro Forma invoice. at the time of ordering
- 3 We draw the attention of all customers to the notes in our catalogue relating to definitions, analyses and calibration procedures.
- 4 To the extent that the law may permit, the following condition stands in substitution for all conditions and warranties as to merchantability and fitness for purpose as implied by statute, common law or otherwise.
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