Innov-X Alloy Analyzers
Aluminum Alloy Sortability Guide

DELTA Dynamic XRF

Bold Grades = Best Performance with Premium		
Premium	Standard	Classic
47 Grades	39 Grades	24 Grades
319	319	***2024 plus***
333	333	***2024 plus***
355	355	355
356	356-7	*1100/6063-plus*
357	356-7	*1100/6063-plus*
380	380	***2024 plus***
383	383	***2024 plus***
384	384	***2024 plus***
1100	*1100/6063-plus*	*1100/6063-plus*
2007	2007	2007
2011	2011	2011
2014-17	2014-17-std	***2024 plus***
2018	2018	2018
2024	2024	***2024 plus***
2117	2117	2117
2098-195	2098-195	2098-195
2219-519	2219-519	2219-519
2618	2618	2618
3002	*1100/6063-plus*	*1100/6063-plus*
3003	***3003/5***	***3003/4/5***
3004	3004	***3003/4/5***
3005	***3003/5***	***3003/4/5***
3105	*1100/6063-plus*	*1100/6063-plus/**5052***
4032	4032	4032
5005	*1100/6063-plus*	*1100/6063-plus*
5042	5042	***5086-plus***
5052	5052	***5052-plus***
5056-82	5056-82	*1100/6063-plus/**5052***
5083	5083	***5086-plus***
5086	5086	***5086-plus***
5154	5154	5154
5454	5454	5454
5657	6063-plus	6063-plus
6061	6061	6061
6063	*1100/6063-plus*	*1100/6063-plus*
6070	6070	6070
6253	6253	6253
6262	6262	6262
7005	7005	7005
7016	7016	7016
7019	7019	7019
7039	7039	7039
7050	7050	7050
7075	7072	7072
7075	7075	7075
7104	7104	7104
7049+	7049+	7049+

The Innov-X DELTA Line of analyzers enables a new, broader range of Al alloy identification than ever before possible with handheld XRF. Revolutionary light element sensitivity and precision, and innovative ease of use features:

6 times the power – tighter geometry plus 200 µAmp low voltage setting delivers a new world of speed, precision, & range to the challenging world of aluminum sorting

Throughput – many Aluminum grades in as little as 1-2 seconds; closer separations typically done in 10 seconds

SmartSort – ensures the fastest and most accurate tests no matter the alloy - no compromises!

Customizable Smart Library Features

- Match the analyzer's sorting logic to your operation
- Automatically provide sorting instructions to operators
- Fast customization on-site
- Most conclusive results

Understanding Innov-X Alloy Analyzer Sorting Capabilities

To choose the best analyzer for your Al sorting needs, it is important to know the full range of Al alloys you will encounter. The analyzer sorts by comparing highly specific material chemistry against grade specifications in the analyzer's extensive library. As analyzer performance incrementally increases, so does the ability to sort additional grades and more grade differences.

Example: If you work with a limited range of the more popular wrought Al alloys, such as 3003, 2024, 7050, 7075, 6061, 6063, then you will be able to sort 3003 reliably from the other grades you encounter with a DELTA Classic analyzer. However, if your operation works with ALL of the Al alloys shown at left, in order to separate 3003 from other 3000 series grades, you will need the upgraded detector and performance of the DELTA Premium alloy analyzer.

NOTE: This chart is to be used as a guide only. Please contact your local Innov-X representative to assist you in making a final decision regarding the correct Innov-X handheld analyzer for your aluminum alloy sorting needs.

APPLICATION GUIDE

INNOV-X SYSTEMS™

Common Overlapping Aluminum Grades Table

Sorting Keys:

- Second Beam/SDD Units only
- Required Element — minimum & maximum specifications
- Required & Unique — defines grade vs similar grades
- Helpful in separating from similar grades

Grade Name	Mg	Al	Si	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Sn	Comments
1100/1100-plus		98.6 - 99.95	0.70	0.00				0.75		0.05 - 0.20			>99.5% LE (Mg+Al+Si) and <0.95% Fe+Si
6063/6063-plus	0.45 - 0.90	97.75 - 99.35	0.2 - 0.6			0.10	0.10	0.35		0.10	0.10		Mg, Si, Cu, Cr combo helps ID this grade
356	0.45 - 0.60	89.75 - 93.30	6.5 - 7.5	0.2			0.03			0.2	0.05		Only req'd elements are LE
357	0.20 - 0.45	89.75 - 93.30	6.5 - 7.5	0.25			0.35			0.25	.035		Only req'd elements are LE
5657	0.6 - 1.0	98.69 - 99.4	0.08			0.03	0.10	0.10					Si sorts vs 6063; Si, Cr, & Fe sorts vs 5005
5005	0.5 - 1.1	96.95 - 99.5	0.30		0.10	0.20	0.20	0.70	0.25	0.20			Overlaps w 6063 (Si may help)
3002	0.20	99.09 - 99.95	0.08	0.03			0.05 - 0.25	0.10		0.15	0.10		Mg & Mn allow 2nd beam ID
2024/2024-plus	1.2 - 1.8	91.0 - 94.7		0.15			0.3 - 0.9	0.50	0.00	3.8 - 4.9	0.25		Mg sorts vs 2014-17; Si & Mg sorts vs 300s
2014-17	0.20 - 0.80	90.6 - 95.7	0.2 - 1.2	0.15		0.10	0.4 - 1.2	0.70		3.5 - 5	0.25		Mg sorts vs 2024-plus; Si sorts vs 300s
319	0.10	86.3 - 91.5	5.5 - 6.5	0.25			0.50	1.00	0.35	3.0 - 4.0	1.00		Si sorts vs other 300s; Cu may help sort from 2000s
333	0.05 - 0.5	80.25 - 88.9	8.0 - 10.0	0.25			0.05 - 0.5	1.00	0.50	3.0 - 4.0	3.00		Si overlaps can complicate sorting within 300s
380	0.10	80.15 - 89.5	7.5 - 9.5	0.25			0.50	2.00	0.50	3.0 - 4.0	3.00		Si overlaps can complicate sorting within 300s
383	0.50	79.9 - 88.5	9.5 - 11.5				0.50	1.30	0.30	2.0 - 3.0	3.00		Si overlaps can complicate sorting within 300s
384	0.10	78.15 - 86.5	10.5 - 12.0				0.50	1.00	0.50	3.0 - 4.5	2.90	0.35	Si overlaps can complicate sorting within 300s
3003 or 4 or 5	1.30	95.85 - 98.15	0.30			0.20	1.0 - 1.5	0.70		0.30	0.15		3003/4/5 vary by Mg - none/0.5%/1%
5052/5052-plus	2.2 - 2.8	95.9 - 97.65	0.25			0.15 - 0.35	0.1	0.4		0.1	0.1		Cr helps ID in beam 1, Mg in beam 2
5056-82	4.0 - 5.6	92. 0 - 96.0			0.2	0.2	0.4	0.15	0.25				Only Mg & Al req'd; w/o LE mixes w 5052 & 5086
5086/5086-plus	3.5 - 4.5	93.15 - 96.25	0.40			0.05 - 0.25	0.2 - 0.7	0.5		0.1	0.25		Mn & Cr w no Cu sorts in beam 1
5083	4.0 - 4.9	92.55 - 95.55	0.40	0.15		0.05 - 0.25	0.4 - 1.0	0.40		0.10	0.25		Mn & Cr w no Cu sorts in beam 1
3002	0.20	99.09 - 99.95	0.08	0.03			0.05 - 0.25	0.10		0.15	0.10		Low Mg & req'd Mn allow 2 beam ID
3105	0.2 - 0.8	96.1 - 99.5	0.40	0.10		0.20	0.3 - 0.8	0.70		0.10	0.25		Mg to sort vs 1100 & 5086-plus
5042	3.0 - 4.0	94.35 - 96.8	0.2	0.1		0.1	0.2 - 0.5	0.35		0.15	0.25		Low/no Cr helps v 5083 & 5086

Please note: Most aluminum grades allow up to 0.05% of elements not listed in the specification. Single values listed for elements are max allowable concentrations.

TBD-4/10

Innov-X Systems, Inc 100 Sylvan Road, Suite 500 Woburn, MA 01801 USA T. 1-781-938-5005 F. 1-781-938-0128 info@innovx.com