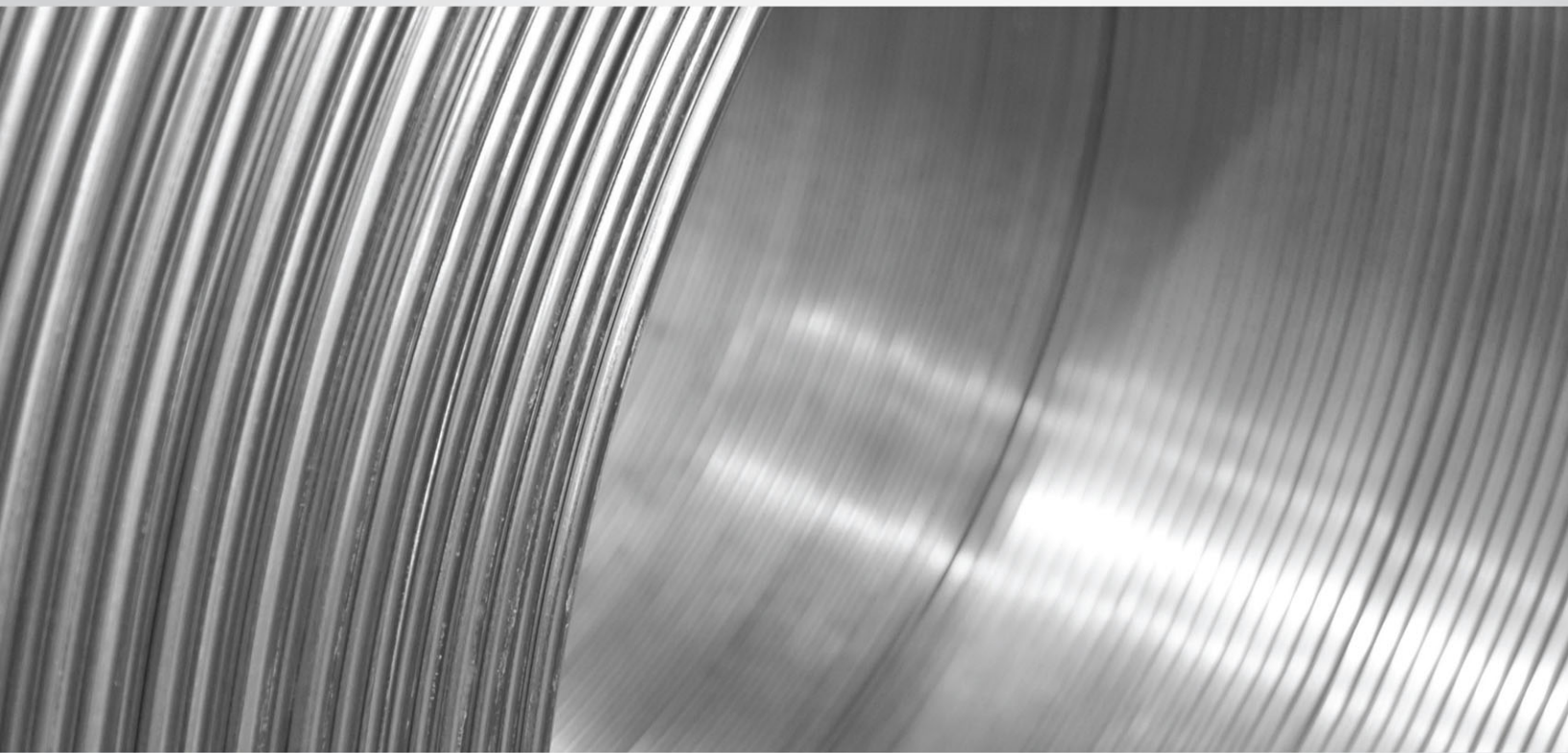




ALUMINUM REDDRAW ROD



INDALCO ALLOYS

ALUMINUM REDRAW ROD



- CONTINUOUS CASTING PROCESS IS UNIQUE AND STATE OF THE ART FOR PRODUCING THE HIGHEST QUALITY ROD POSSIBLE.
- ABLE TO CAST MOST ALLOYS WITH VERSATILITY IN BATCH SIZES.
- CHEMISTRY OF THE REDRAW ROD IS HELD TO A TIGHTER TOLERANCE THAN INDUSTRY STANDARDS.
- 100% VIRGIN METAL IS USED IN PRODUCTION; NO RECYCLED MATERIAL IS USED IN THE CASTING PROCESS.



QUALITY CONTROLLED
FROM START TO FINISH

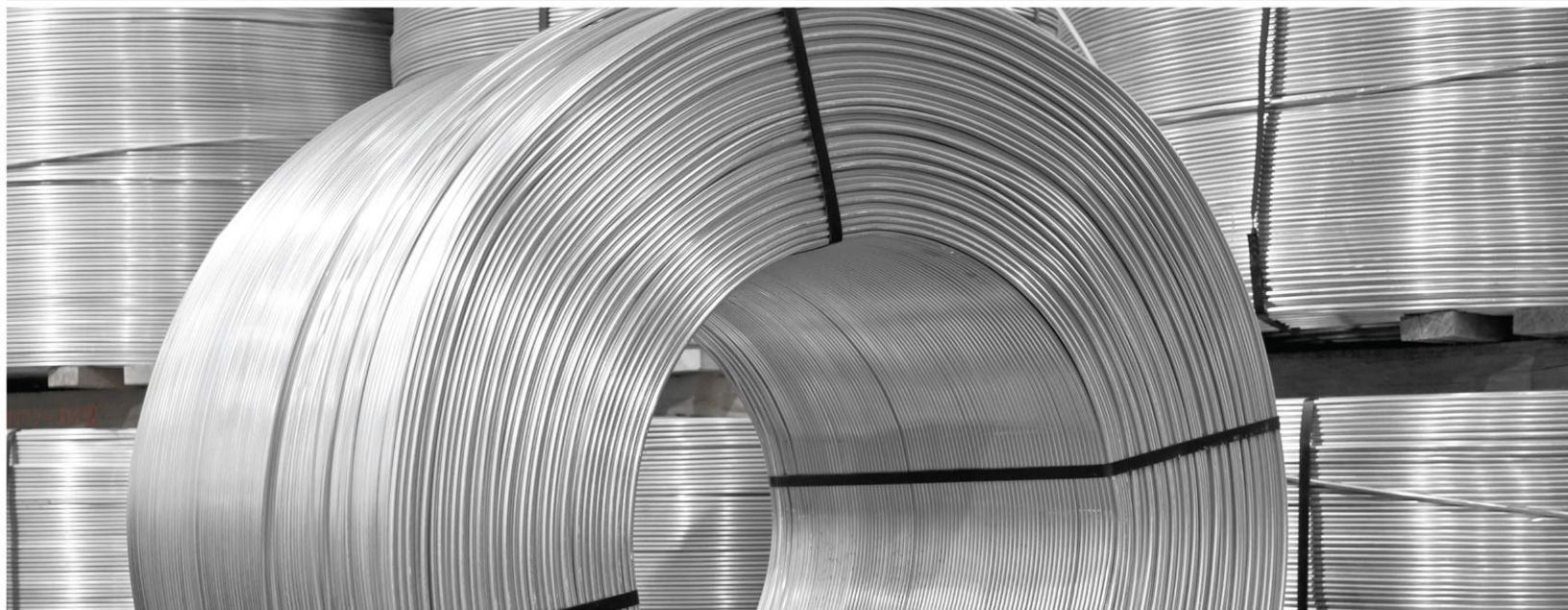
INDALCO TRADITION

Indalco has a tradition of casting aluminum redraw rod from high-grade aluminum that spans decades. Our people possess a wealth of knowledge and experience gained in the industry. Featuring a cast house with automated tilting furnaces, a continuous cast rolling mill, along with an in-house homogenizing furnace, Indalco is able to provide an outstanding rod product that customers worldwide have come to trust. With a commitment to product quality and cost efficiency, investment in new equipment is continual. In addition to producing welding grades, continuous cast rod for mechanical wire and the cable industry is also available.

As a redraw rod producer, Indalco can be described as a boutique-sized manufacturer, elite and highly specialized to meet any discerning customer needs. This is illustrated by Indalco's ability to customize a unique range of metallurgical options that includes filtration, degassing, and heat-treating. A broad range of aluminum alloys, specially tailored to specification, cast in large or small batch sizes, with premium coil winding, are the standards of Indalco's production capability.

As a part of Indalco's commitment to quality, all manufacturing is compliant to the ISO 9001 registered Quality Management System. Additionally, reducing environmental impacts is a focus of the operation, and the Indalco facilities are registered to the ISO 14001 EHS standard.

Indalco redraw rod provides consistent chemistries, and a premium quality product, every time.



Manufacturing Specification of Aluminum Alloys for Redraw Rod

For all applicable product requirements as stated in AWS A5.10/A5.10M and ISO18273 shall be met; For non welding grade aluminum alloys, the chemistry requirements of applicable specifications and Aluminum Association "Teal Sheets" shall be met. Grades or sizes not mentioned here shall be handled as "made to order".

Chemical composition^a (wt%)

| Alloy Grade | Chemical composition ^a (wt%) | | | | | | | | | | Other Elements | |
|--------------------|---|------|-----------|-----------|-----------|------|-----------|-----------|--------|---------------------------|----------------|-------|
| | Si | Fe | Cu | Mn | Cr | Zn | Ti | Mg | Be | Zr,V,Ga | Each | Total |
| 1050 | 0.25 | 0.30 | 0.05 | 0.05 | 0.03 | 0.05 | 0.03 | 0.05 | 0.0002 | | 0.03 | - |
| 1070 | 0.20 | 0.25 | 0.04 | 0.03 | - | 0.04 | 0.03 | 0.03 | 0.0002 | V 0.05 | 0.03 | - |
| 1100 ^b | 0.25 | 0.30 | 0.05-0.20 | 0.05 | 0.05 | 0.05 | 0.03 | 0.05 | 0.0002 | | 0.05 | 0.15 |
| 1188 ^b | 0.06 | 0.06 | 0.005 | 0.01 | - | 0.03 | 0.01 | - | 0.0002 | V 0.05; Ga 0.03 | 0.01 | - |
| 1350 ^c | 0.10 | 0.30 | 0.05 | 0.01 | 0.01 | 0.05 | - | - | 0.0002 | Ga 0.03 | 0.03 | 0.10 |
| 1450 | 0.25 | 0.40 | 0.05 | 0.05 | - | 0.07 | 0.10-0.20 | 0.05 | 0.0002 | | 0.03 | - |
| 2117 ^d | 0.50 | 0.50 | 2.2-3.0 | 0.20 | 0.10 | 0.25 | 0.05 | 0.20-0.50 | 0.0002 | | 0.05 | 0.15 |
| 2319 | 0.20 | 0.30 | 5.8-6.8 | 0.20-0.40 | 0.05 | 0.10 | 0.10-0.20 | 0.02 | 0.0003 | Zr 0.10-0.25; V 0.05-0.15 | 0.05 | 0.15 |
| 4018 | 6.5-7.5 | 0.20 | 0.05 | 0.05 | - | 0.05 | 0.10 | 0.50-0.70 | 0.0002 | | 0.05 | 0.15 |
| 4043 | 4.7-5.3 | 0.30 | 0.30 | 0.05 | 0.05 | 0.05 | 0.03 | 0.04 | 0.0002 | | 0.05 | 0.15 |
| 4047 | 11.0-13.0 | 0.30 | 0.05 | 0.05 | 0.05 | 0.05 | 0.03 | 0.04 | 0.0002 | | 0.05 | 0.15 |
| 5019 ^d | 0.10 | 0.30 | 0.10 | 0.10-0.20 | 0.20 | 0.10 | - | 4.5-5.0 | 0.0003 | | 0.05 | 0.15 |
| 5051 ^d | 0.25 | 0.35 | 0.05 | 0.20 | 0.10 | 0.10 | 0.05 | 1.80-2.10 | 0.0003 | | 0.05 | 0.15 |
| 5052 ^d | 0.25 | 0.30 | 0.05 | 0.10 | 0.15-0.20 | 0.10 | 0.04 | 2.2-2.5 | 0.0003 | | 0.05 | 0.15 |
| 5056 ^d | 0.10 | 0.30 | 0.10 | 0.10-0.20 | 0.05-0.20 | 0.10 | - | 4.5-5.0 | 0.0003 | | 0.05 | 0.15 |
| 5087 | 0.10 | 0.30 | 0.05 | 0.70-1.0 | 0.05-0.25 | 0.25 | 0.15 | 4.5-5.2 | 0.0003 | Zr 0.10 - 0.20 | 0.05 | 0.15 |
| 5154 ^d | 0.10 | 0.30 | 0.05 | 0.10 | 0.17-0.25 | 0.10 | 0.06 | 3.2-3.5 | 0.0003 | | 0.05 | 0.15 |
| 5154A ^d | 0.10 | 0.30 | 0.05 | 0.25-0.35 | 0.08 | 0.10 | 0.04 | 3.2-3.5 | 0.0003 | | 0.05 | 0.15 |
| 5183 | 0.10 | 0.30 | 0.05 | 0.60-1.0 | 0.06-0.14 | 0.10 | 0.06-0.10 | 4.7-5.10 | 0.0003 | | 0.05 | 0.15 |
| 5186 ^d | 0.20 | 0.20 | 0.05 | 0.20-0.30 | 0.05 | 0.10 | 0.15 | 3.8-4.8 | 0.0003 | Zr 0.05 | 0.05 | 0.15 |
| 5356 -01 | 0.10 | 0.30 | 0.05 | 0.06-0.20 | 0.06-0.15 | 0.10 | 0.06-0.13 | 4.55-5.0 | 0.0003 | | 0.05 | 0.15 |
| 5356 -50 | 0.10 | 0.30 | 0.05 | 0.10-0.15 | 0.10-0.15 | 0.09 | 0.08-0.13 | 4.55-5.0 | 0.0003 | | 0.05 | 0.15 |
| 5554 | 0.10 | 0.30 | 0.05 | 0.50-0.75 | 0.05-0.15 | 0.10 | 0.07-0.13 | 2.4-2.6 | 0.0003 | | 0.05 | 0.15 |
| 5556 | 0.10 | 0.30 | 0.05 | 0.55-0.80 | 0.05-0.10 | 0.09 | 0.06-0.10 | 4.70-5.2 | 0.0003 | | 0.05 | 0.15 |
| 5556A | 0.10 | 0.30 | 0.05 | 0.60-0.80 | 0.05-0.10 | 0.09 | 0.06-0.10 | 5.0-5.5 | 0.0003 | | 0.05 | 0.15 |
| 5654 | 0.10 | 0.30 | 0.05 | 0.01 | 0.15-0.35 | 0.10 | 0.05 0.15 | 3.1-3.6 | 0.0003 | | 0.05 | 0.15 |
| 5754 | 0.10 | 0.30 | 0.05 | 0.20-0.40 | 0.20 | 0.20 | 0.15 | 2.6-3.6 | 0.0003 | | 0.05 | 0.15 |
| 6053 ^d | 0.6-0.73 | 0.30 | 0.10 | 0.05 | 0.17-0.25 | 0.10 | 0.05 | 1.15-1.25 | 0.0002 | | 0.05 | 0.15 |
| 6061 ^d | 0.51-0.62 | 0.25 | 0.22-0.34 | 0.15 | 0.10-0.17 | 0.05 | 0.15 | 0.86-0.91 | 0.0002 | | 0.05 | 0.15 |
| 6101 ^d | 0.50-0.55 | 0.40 | 0.10 | 0.03 | 0.03 | 0.10 | 0.03 | 0.60-0.65 | 0.0002 | | 0.05 | 0.15 |
| 6201 ^e | 0.50-0.55 | 0.40 | 0.10 | 0.03 | 0.03 | 0.10 | 0.03 | 0.60-0.65 | 0.0002 | | 0.05 | 0.15 |
| 357.0 | 6.5-7.5 | 0.15 | 0.05 | 0.03 | - | 0.05 | 0.20 | 0.45-0.6 | 0.0002 | | 0.05 | 0.15 |

a: Single values are maximum; Aluminum shall be deemed as a remainder, excluding 1050 Al 99.50% min., 1070 Al 99.70% min., 1100 Al 99.00% min., 1188 Al 99.88% min., 1350 Al 99.50% min. and 1450 Al 99.50% min.; The Rounding method listed in the ASTM Designation E-29-08 shall be used in reporting chemical analysis; b: Can also be considered as metallizing wire; c: EC grade, V+Ti ≤ 0.02%; B ≤ 0.05%; d: mechanical alloy; e: Can also be considered as EC grade.

| Rod Size | Roundness (Max.) ^h | Rod Tolerances | Coil ID ^g | Coil OD ^g | Coil Width ^g | Coil Weight (Max.) |
|------------------------|-------------------------------|----------------|----------------------|----------------------|-------------------------|--------------------|
| in. [mm] | in. [mm] | in. [mm] | in. [mm] | in. [mm] | in. [mm] | Lb. [kg.] |
| 3/8 ^f [9.5] | 0.01 [0.25] | ± 0.015 [0.40] | 29.9 [760] | 63.0 [1600] | 35.0 [890] | 5610 [2550] |

f: 1/2" is available upon request; g: refers to nominal values and have a + tolerance of 10%; h: Roundness equals the maximum minus the minimum diameter.

MECHANICAL PROPERTIES (3/8" rod except indicated, reporting as measured for alloy not on the list)

| Alloy Grade | Tensile Strength (psi) | | Temper | Elong. % (10" Sam.) | Alloy Grade | Tensile Strength (psi) | | Temper | Elong. (% 10" Sam.) |
|-------------|------------------------|---------|--------|---------------------|-------------|------------------------|---------|--------|---------------------|
| | Minimum | Maximum | | | | Minimum | Maximum | | |
| 1050 | 12,000 | 19,000 | F | 10 | 5154A | 33,000 | 39,000 | F | 16 |
| 1100 | 13,000 | 22,000 | F | 12 | 5183 | 42,000 | 49,000 | F | 18 |
| 1188 | 10,000 | 16,000 | F | 12 | 5183 | N/A | 47,000 | H | 22 |
| 1350 | 12,000 | 19,000 | F | 10 | 5356 -01 | 39,000 | 46,000 | F | 19 |
| 1450 | 12,000 | 18,000 | F | 12 | 5356 -50 | 39,000 | 47,500 | F | 19 |
| 2117 | 29,000 | 35,000 | F | 14 | 5554 | 31,000 | 37,000 | F | 18 |
| 2319 | 24,000 | 29,000 | F | 16 | 5556 | 40,000 | 46,000 | F | 18 |
| 4043 | 20,000 | 27,000 | F | 15 | 5556A | 42,000 | 50,000 | F | 18 |
| 4043 | 20,000 | 27,000 | F | 15 | 5556 | N/A | 48,000 | H | 22 |
| 4043 | N/A | 19,000 | H | 23 | 5654 | 33,000 | 39,000 | F | 20 |
| 4047 | 27,000 | 33,000 | F | 15 | 5754 | 33,000 | 39,000 | F | 19 |
| 4047 | N/A | 24,000 | H | 22 | 6053 | 18,850 | N/A | F | 13 |
| 5019 | 39,000 | 46,000 | F | 19 | 6061 | 27,000* | - | T4 | 10 |
| 5052 | 29,000 | 34,000 | F | 15 | 6061 1/2 | 27,000* | - | T4 | 10 |
| 5056 | 39,000 | 46,000 | F | 19 | 6101 | 21,000 | 25,000 | F | 10 |
| 5087 | 42,000 | 48,000 | F | 18 | 6201 | 23,000 | 29,000 | T4 | 10 |
| 5154 | 31,000 | 37,000 | F | 16 | | | | | |

*: Just after cast; In 3 weeks after casting, the UTS (min.) 28ksi.

The rod shall be free of cracks, chevrons and pitting. Scratches, guide roller marks and improper layer winding must be minimal so as not to cause drawing problems.