

**William Rowland Ltd.**

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## Non Ferrous Metals

### ALUMINIUM

<b>SYMBOL:</b>	Al
<b>ATOMIC WEIGHT:</b>	26.98
<b>MELTING POINT:</b>	660°C
<b>SPECIFIC GRAVITY:</b>	(@ 20°C) 2.69
	<a href="#">More Information...</a>

For use in non-ferrous applications in the form of ingots 1 kg to 25 kg assaying at 99.7% to 99.9% Al. Also as deoxidation products available in 95– 99% grades, alternative specifications available on request. We also have available the full range of LM grades in ingot form.

### ANTIMONY

<b>SYMBOL:</b>	Sb
<b>ATOMIC WEIGHT:</b>	121.76
<b>MELTING POINT:</b>	630.5°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 6.68

Available in approximately 20 kg ingots (99.65% Sb min) used for alloying purposes. The material is quite brittle and is readily broken down to give smaller pieces.

### BISMUTH

<b>SYMBOL:</b>	Bi
<b>ATOMIC WEIGHT:</b>	209.00
<b>MELTING POINT:</b>	271.3°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 9.80

We supply ingots and pellets, 99.99% Bi pharmaceutical grade and metallurgical grade. The pellets are produced in the 2.5 gram to 150 gram range for ladle addition to assist the suppression of the formation of flake graphite in malleable cast iron production.

## CADMIUM

<b>SYMBOL:</b>	Cd
<b>ATOMIC WEIGHT:</b>	112.41
<b>MELTING POINT:</b>	320.9°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 8.65

We can supply 99.99% min. purity metal in sticks (240 gram) for alloys, colours and chemicals, and also ball anodes (500 gram) for the plating industry. We also supply a range of cadmium sheets, wire and powder for various applications.

## CALCIUM

<b>SYMBOL:</b>	Ca
<b>ATOMIC WEIGHT:</b>	40.08
<b>MELTING POINT:</b>	845°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 1.57

Calcium in its pure form is hazardous and is only used as an additive under controlled conditions, nevertheless it finds application in the aluminium, copper and lead industries.

Calcium can be used in certain high temperature alloys for its strong deoxidation and desulphurisation properties. The principle forms available are ingots, crowns, granules and needles.

Typical analysis is Ca 97%, Al 1.8%, Mg 0.8%. Higher grades are available on request.

More stable forms of calcium are available for the iron and steel maker including calcium silicon, calcium silico manganese, calcium nickel (Incoal Alloy 10) – see separate entries.

## CHROMIUM


<b>SYMBOL:</b>	Cr
<b>ATOMIC WEIGHT:</b>	52.01
<b>MELTING POINT:</b>	1875°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 7.19
	<a href="#">More information...</a>

We are the UK Distributor for Delachaux – France, who produce aluminothermic grades 99.4% min for air melting and 99.6% Cr min. for vacuum melt applications. Delachaux also produces a unique double degassed briquette (DDB) 99.8% Cr min. which is equivalent to the highest quality electrolytic grades, for the production of aerospace superalloys and for exacting applications where residual element control is critical.

## COBALT

<b>SYMBOL:</b>	Co
<b>ATOMIC WEIGHT:</b>	58.94
<b>MELTING POINT:</b>	1495°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 8.9

We are stockists of INCO cobalt cathode rounds (cobalt 99.9%) which are produced by the electrolytic process in Canada. The rounds are approximately 35 mm diameter x 6 mm thick. The high purity leads to their use in the production of superalloys and the convenient shape and size makes them ideal for other applications including the manufacture of magnets and special chemicals. Also available is Russian Ingot (10-15 kg) with 99.3% Co min. and Electrolytic flake 99.6% Co min.

<b>Cobalt Rounds</b>	
	INCO® Electrolytic Cobalt Rounds are a high-purity, primary form of the metal produced by electrowinning. The unique button-shape makes this product safe, convenient to handle and easy to transfer from drums...

## COPPER

<b>SYMBOL:</b>	Cu
<b>ATOMIC WEIGHT:</b>	63.54
<b>MELTING POINT:</b>	1083°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 8.92
	<a href="#">More information...</a>

We supply high grade copper cathode (99.99%Cu min) to BS EN 1978:1998 Cu CATH 1 as full plate or cut in various sizes down to 1" squares. We can also offer copper granules for the precious metals and cast iron industries, copper rod and a range of copper based alloys are also available.

## INDIUM

<b>SYMBOL:</b>	In
<b>ATOMIC WEIGHT:</b>	114.82
<b>MELTING POINT:</b>	156.61°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 7.31

Available in ingot form with 99.95% min. purity, used in low melting point alloys, special chemicals, solders and bearing applications. High purity grades are available up to 99.9999 min. in the form of ingots, rod, wire,

sheet, teardrops and powders.

## LEAD

<b>SYMBOL:</b>	Pb
<b>ATOMIC WEIGHT:</b>	207.21
<b>MELTING POINT:</b>	327.4°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 11.34

Available in the form of full ingots (15– 40 kg) or cropped to customers' requirements, specification 99.97% and 99.99% Pb min. Also available in the form of sheet or shot.

## MAGNESIUM

<b>SYMBOL:</b>	Mg
<b>ATOMIC WEIGHT:</b>	24.32
<b>MELTING POINT:</b>	650°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 1.74

Available in ingots (99.9% min) of approx 8 kgs and small pieces of 100, 200 and 300 grams for alloying applications in the non-ferrous metals field and as a special treatment additive in ductile iron.

## MANGANESE

<b>SYMBOL:</b>	Mn
<b>ATOMIC WEIGHT:</b>	54.94
<b>MELTING POINT:</b>	1245°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 7.20

Supplied in the form of electrolytic flake (99.7 and 99.9% min. grades) for alloying applications in copper base alloys and nickel base superalloys. Electrolytic manganese can also be used in preference to ferro-manganese in certain stainless steels where residual element control is critical. Also supplied in the form of powder (99.7% min) size 40 mesh x down used in aluminium alloying applications by cored wire injection method.

## MISCHMETAL

### NON-ELEMENTAL

Available in the form of 30 or 56 gram pieces or 450 gram trapezoids typically Ce 50%, La 25%, Nd 16%, Pr 5%, other rare earths 3%. Mischmetal is used to control residual elements, thus influencing graphite morphology in ductile iron and also as an inclusion modifier in steelmaking. We can also supply the individual rare earth metals. Rare earth silicide is available on request.

## MOLYBDENUM

<b>SYMBOL:</b>	Mo
<b>ATOMIC WEIGHT:</b>	95.95
<b>MELTING POINT:</b>	2615°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 10.22

Pure solids, sheet cuttings, bar ends, etc.99% to 99.995% min. suitable for various re-melting applications including vacuum melting.

## NICKEL

<b>SYMBOL:</b>	Ni
<b>ATOMIC WEIGHT:</b>	58.71
<b>MELTING POINT:</b>	1453°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 8.90
	<a href="#">More information...</a>

We are the U.K. distributors for INCO EUROPE LIMITED and supply their range of melting products and powders including pellet, cathode and foundry alloys i.e. Incomag, Incocal and powders (see [powder section](#) for details).

Nickel is a vital additive in iron and steel production, promoting strength at both elevated and cryogenic temperatures. It is particularly beneficial in stainless steels and superalloys, in fact stainless steel accounts for more than 60% of the world's demand for nickel.

For **NICKEL POWDERS** see under our [POWDERS](#) section.

## NICKEL SUPERALLOY ADDITIVES

### NON-ELEMENTAL

We supply a range of alloys for use in superalloy production, mainly as nickel-niobium (40/60), also nickel-vanadium, nickel-chromium, nickel-boron and nickel-molybdenum in the form of walnut size pieces and powder.

## PEWTER

### NON-ELEMENTAL

Pewter wholly produced from virgin metals in our foundry is available in 13 kg ingot and 1 kg bar form to the following specifications (92% Sn, 6% Sb, 2% Cu) (93% Sn, 7% Sb), or (88% Sn, 12% Sb). These analyses can be modified to meet customers' specific requirements.

## SILICON

<b>SYMBOL:</b>	Si
<b>ATOMIC WEIGHT:</b>	28.09
<b>MELTING POINT:</b>	1410°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 2.33

Available in the lumpy or powder forms for use in non-ferrous alloying applications especially in aluminium and copper base products. The standard product is 98.5% Si min. however, low residual versions are available on request.

## SODIUM

<b>SYMBOL:</b>	Na
<b>ATOMIC WEIGHT:</b>	22.99
<b>MELTING POINT:</b>	97.6°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 0.97

Sodium is a highly reactive metal which finds use in a wide range of fields from plastics to nuclear power. The main forms are ingots and sticks in various shapes and sizes to suit the final application. Typical analysis is Na 99.8%, Ca 500 ppm, K 300 ppm.

Due to its volatility sodium requires special care in use. Packing is also critical with our product normally supplied in nitrogen filled steel drums.

## TIN

<b>SYMBOL:</b>	Sn
<b>ATOMIC WEIGHT:</b>	118.70
<b>MELTING POINT:</b>	231.9°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 7.30

### Tin Ingot

As part of the Amalgamated Metal Corporation, we have access to tin produced by our own smelter and therefore enjoy strong links and tradition in the tin supply industry.

Various grades of 25kg ingot are stocked, ranging from 99.75% to 99.95% minimum purity. Depending on application and the customer's specification, we are able to supply tin conforming to BS EN 610 : 1996 grade 99.85, 99.9, 99.93 and grade 99.95. Using our own shears on site we are able to quickly crop 25 kg ingots down to the customer's needs, allowing easier handling and alloying additions. Cropped material is always palletised or packed in clean steel drums.

We also stock tin of 99.99% minimum purity in the form of 1kg bars where low levels of residual elements are important. As with ingot, this material can be cropped if required.

We also produce tin as 28 gram and 56 gram pellets, 112 gram strips, granules and a range of tin anodes. The pellets are designed for use as a pearlite stabiliser in the production of cast iron.

For more information see [Low Melting Point Alloys](#)

## TUNGSTEN

<b>SYMBOL:</b>	W
<b>ATOMIC WEIGHT:</b>	183.86
<b>MELTING POINT:</b>	3410°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 19.3

We can supply Tungsten Metal scrap in various forms, e.g. solids, bar ends, wire, powder, etc.

## WHITEMETAL BEARING ALLOYS

### NON-ELEMENTAL

In our own foundry we are able to produce alloys in 13 kg ingot and 1 kg bars. These alloys are tin based with additions of copper and antimony to British Standard or individual customer specifications.

For more information see [Low Melting Point Alloys](#).

## ZINC

<b>SYMBOL:</b>	Zn
<b>ATOMIC WEIGHT:</b>	65.38
<b>MELTING POINT:</b>	419.5°C
<b>SPECIFIC GRAVITY:</b>	(@20°C) 7.13

We can supply a range of zinc products including ingots and balls. The ingots (approximately 25 kg) are available as special high grade (SHG) with 99.995% Zn min. used for diecasting applications. Zinc balls 99.995% Zn min. are available for plating applications, zinc granules are produced in our foundry from high grade material for the chemical and jewellery industries.