

# SPECIAL METALS WIGGIN

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# WIRE PRODUCTS

There is a wide variety of applications that call for metal products in the form of wire, and for the corrosion-resistance, high-temperature strength, electrical resistance, or other properties of the Special Metals high-performance alloys.

- Springs for service at high temperatures or in aggressively corrosive environments
- Fasteners
- Well screens and filters
- Wire mesh demisters
- Woven wire conveyor belts
- Heat treatment baskets
- Lamp filaments, filament supports & electrodes
- Electronic instrument components
- Automobile spark plugs & exhaust valves
- Welding wires & core wire for flux-coated electrodes

To meet these needs, Special Metals manufactures pure nickel, and the **MONEL**<sup>®</sup>, **INCONEL**<sup>®</sup>, **INCOLOY**<sup>®</sup>, **BRIGHTRAY**<sup>®</sup>, **NIMONIC**<sup>®</sup>, **KOTHERM**<sup>®</sup>, **NIOTHERM**<sup>®</sup>, **INCOTHERM**<sup>®</sup> and **NILO**<sup>®</sup> alloys, in wire form, in a range of diameters. The following pages describe the alloys and sizes available from the Wire Products division of Special Metals Wiggin Ltd.

Electrical resistance and thermo-element wire are available from our affiliated company, Rescal SA.

Finished welding products are available from Inco Alloys International Welding Products, another Special Metals company.

No other manufacturer has greater experience of the properties and performance of these alloys. Over 80%, of the products mentioned in this publication were invented and developed in our own research laboratories.

## **SPECIAL METALS**

# **QUALITY ASSURANCE**

The pedigree of the Special Metals wire products begins with the control of raw materials and the selection of melting processes. According to the alloy and the application for which it is intended, the melting procedures can include air melting, AOD refining, vacuum induction melting, and vacuum arc or electroslag remelting. For some specialised applications, wire products are made by mechanical alloying. From start to finish, the alloys are made according to detailed procedures to control quality at every manufacturing operation. As you would expect from a company with years of service to the aerospace industry, the attention to quality is of the highest order, and the manufacturing history of every product is fully traceable.

State-of-the-art production facilities and order handling systems ensure that all requirements are met and that delivery is fast, and on schedule. Commercial and technical specialists track every order through every processing stage. Up-to-the minute information on order status is immediately available from computer-based monitoring systems.

Technical assistance on alloy evaluation and selection for specific service conditions is available from the world's most experienced producer of high-performance nickel alloys.

Special Metals Wiggin Ltd. Quality Management Systems are approved to Lloyd's Register Quality Assurance (ISO 9002/EN 29002/BS 5750, Part 2: 1987).



# DESIGNATIONS & SPECIFICATIONS FOR THE SPECIAL METALS WIGGIN LTD. WIRE PRODUCTS

Alloy	UNS	Werkstoff Nr.	BS	ASTM	SAE AMS	AECMA
Nickel 200	N02200	2.4060 2.4066	3075 (NA11)	-	-	-
Nickel 201	N02201	2.4061 2.4068	-	-	-	-
Nickel 205	N02205	2.4061	-	F9	5555	-
Nickel 212	-	2.4110	-	-	5555	-
Nickel 240	-	-	-	-	-	-
Nickel 270	N02270	-	-	-	-	-
MONEL alloy 400	N04400	2.4360	3075 (NA13)	-	4730-31	PrEN2305
MONEL alloy K-500	N05500	2.4375	3075 (NA18)	-	-	-
FERRY alloy	-	2.0842	-	B267	-	-
INCONEL alloy 600	N06600	2.4816	3075 (NA14)	B166	5687	-
INCONEL alloy 600SP	-	-	-	-	-	-
INCONEL alloy 601	N06601	2.4851	-	-	-	-
INCONEL alloy 606	-	-	-	-	-	-
INCONEL alloy 617	N06617	2.4663	-	-	-	-
INCONEL alloy 625	N06625	2.4856	-	-	5837	-
INCONEL alloy 718	N07718	2.4668	-	-	5832	PrEN2952 PrEN2961 PrEN3219
INCONEL alloy X-750	N07750	2.4669	HR505	-	5698-99	-
INCOLOY alloy 800	N08800	1.4876	3075 (NA15)	-	-	-
INCOLOY alloy 800H	N08810	1.4876	-	-	-	-
INCOLOY alloy 800HT	N08811	1.4876	-	-	-	-
INCOLOY alloy 803	-	-	-	-	-	-
INCOLOY alloy 825	N08825	2.4858	-	-	-	-
INCOLOY alloy 864	-	-	-	-	-	-
INCOLOY alloy MA956	567956	-	-	-	-	-
INCOLOY alloy DS	-	1.4864	3075 (NA17)	-	-	-
NI-SPAN alloy C-902	N09902	-	-	-	-	-
INCOLOY alloy A-286	566286	1.4980	HR650	-	-	PrEN2119
INCONEL alloy C-276	N10276	2.4819	-	-	-	-
INCOLOY alloy 25-6MO	N08925	1.4529	-	B649	-	-
	N08926	-	-	-	-	-
WASPALOY	N07001	2.4654	-	-	5828	PrEN2958 PrEN2960 PrEN3220
NIMONIC alloy 70	-	-	-	-	-	-
NIMONIC alloy 75	N06075	2.4951 2.4630	HR504	-	-	PrEN2402
NIMONIC alloy 80A	N07080	2.4952 2.4631	3075 (NA20) HR601	-	-	-
NIMONIC alloy 90	N07090	2.4632	HR503	-	5829	-
NIMONIC alloy 263	N07263	2.4650	-	-	-	-
BRIGHTRAY alloy B	N06004	2.4867	-	B344	-	-
BRIGHTRAY alloy C	N06003	2.4869	-	B344	-	-
BRIGHTRAY alloy S	N06003	2.4869	-	B344	-	-
BRIGHTRAY alloy 35	-	-	-	B344	-	-
KOTHERM alloy KP	-	-	-	-	-	-
KOTHERM alloy KN	-	-	-	-	-	-
NIOTHERM alloy NP	-	-	-	-	-	-
NIOTHERM alloy NN	-	-	-	-	-	-
INCOTHERM alloy TD	-	-	-	-	-	-
NILO alloy 36	K93600 K93601	1.3912	-	-	-	-
NILO alloy 42	K94100	1.3917	-	F30	-	-
NILO alloy 48	K94800	1.3922 1.3926-27	-	F30	-	-
NILO alloy 55	-	-	-	-	-	-
NILO alloy K	K94610	1.3981	-	F15 F29	7726	-

## PRODUCTS & PACKAGING

The Special Metals Wiggin wire products are available in a range of diameters, from 0.20 to 15 mm. General engineering alloys at diameters below 0.8mm are normally supplied by our affiliate company, Rescal SA, as are alloys for electrical resistance heating or thermo-element applications at all diameters.

Other alloys may be restricted by their metallurgy and working characteristics to sizes within the range given.



### *Wire in Coil*

This product is supplied across the range, 0.8 to 15 mm diameter.



### *Wire in Straight Lengths*

This product is supplied in diameters from 0.8 to 15 mm, in lengths up to 4.5m. Centreless ground wire is available in straight lengths in diameters from 5 to 15 mm.



### *Wire in Pay-off Packs*

Available in the range of diameters 0.5 to 2.0 mm in pay-off packs measuring 360 mm OD x 250 mm ID x 270 mm high, or 510 mm OD x 355 mm ID x 380 mm high.



### *Wire on Bulk Drums*

Bulk quantities of small diameter wire (0.8 to 2.5 mm) are available on drums carrying 150-250 kg of wire product.



### *Wire on Spools*

This product is supplied across the range 0.20 to 1.5 mm diameter on plastic spools conforming to DIN 46399.



### *Wire on Formers*

Annealed wire in the range 2.0 – 4.0mm can be supplied pattern layered on formers.

## PRODUCT FINISH

**Bright Annealed** is available, to order, for wire products of 4 mm diameter and below.

**Annealed and Pickled** is available, to order, for wire products of 0.8 mm diameter and above.

**Temper Drawn** products are available, to order.

**Coated** products are available, to order, for cold-heading and spring applications.

**Centreless Ground** products are available as straight lengths in the 5 to 15 mm diameter range.

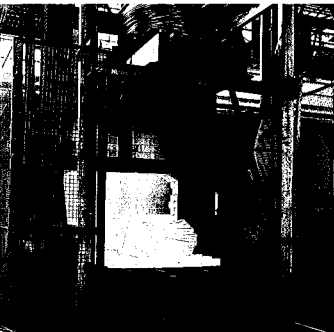
**Shaped Section** wire products are available, in coil, for selected alloys and sizes.

### **Wire Drawn from Customers' Rod**

All the finishes, sizes and packaging methods listed on these pages can be applied to wire drawn from customers' rod.

In general, this service is usually supplied to draw wire in the 0.8 to 12.5 mm diameter range.

Straightening, cut-to-length, grinding, coating, annealing and descaling facilities are available.

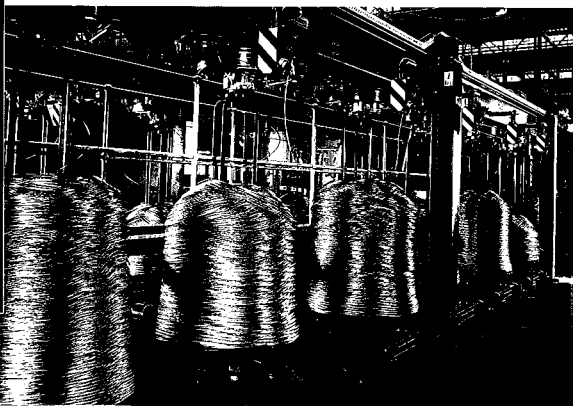
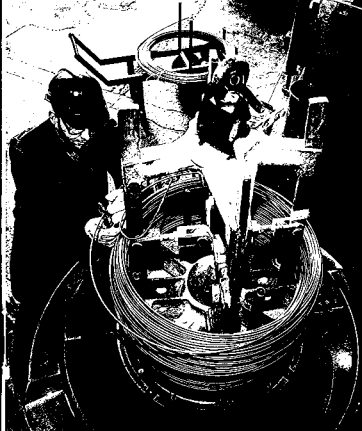


*Heat treatment through an automatic load, unload, and rapid water quench cycle.*



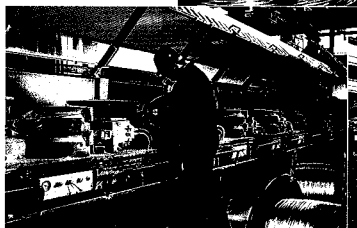
*Some of the thousands of dies held in stock at Hereford.*

*Annealed wire being pattern layered onto formers.*

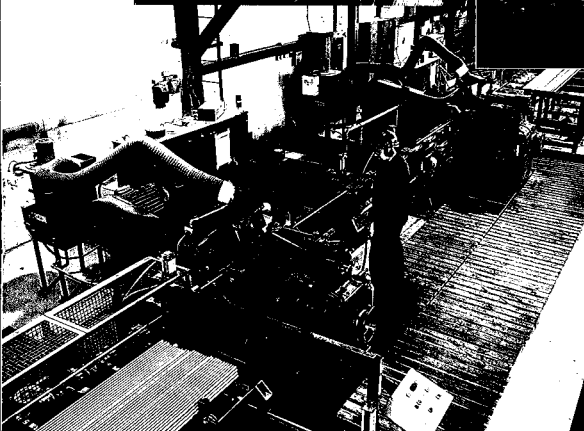


*Drawing of NIMONIC alloy wire for critical fastener applications.*

*Setting up multi-block drawing of BRIGHTRAY alloy wire*



*INCOLOY alloy wire being drawn to a bright finish special temper.*



*Multiple-headed cut-to-length and product name stamping of welding wires.*

*In-line precision centreless grinding with auto-indexing and laser gauge control.*

# CALCULATED WEIGHTS FOR WIRE PRODUCTS

The table below shows weights in kg/km for various diameters of MONEL alloy 400. By applying the conversion factors below, the equivalent weights can be calculated for other Special Metals products.

Note that in practice, small differences can occur due to variations in diameter within permitted tolerances.

## Alloy conversion factors

Nickel 200	1.009
Nickel 201	1.009
Nickel 205	1.007
Nickel 212	1.006
Nickel 240	0.993
Nickel 270	1.013
MONEL alloy 400	1.000
MONEL alloy K-500	0.959
FERRY alloy	1.010
INCONEL alloy 600	0.962
INCONEL alloy 600SP	0.957
INCONEL alloy 601	0.921
INCONEL alloy 606	0.959
INCONEL alloy 617	0.950
INCONEL alloy 625	0.959
INCONEL alloy 718	0.931
INCONEL alloy X-750	0.940
INCOLOY alloy 800	0.903
INCOLOY alloy 800H	0.903
INCOLOY alloy 800HT	0.903
INCOLOY alloy 803	0.893
INCOLOY alloy 825	0.925
INCOLOY alloy 864	0.911
INCOLOY alloy MA956	0.824
INCOLOY alloy DS	0.893
NI-SPAN alloy C-902	0.915
INCOLOY alloy A-286	0.903
INCONEL alloy C-276	1.009
INCOLOY alloy 25-6MO	0.931
WASPALLOY	0.928
NIMONIC alloy 70	0.909
NIMONIC alloy 75	0.950
NIMONIC alloy 80A	0.931
NIMONIC alloy 90	0.931
NIMONIC alloy 263	0.950
BRIGHTRAY alloy B	0.933
BRIGHTRAY alloy C	0.942
BRIGHTRAY alloy S	0.955
BRIGHTRAY alloy 35	0.895
KOTHERM alloy KP	0.992
KOTHERM alloy KN	0.977
NIOOTHERM alloy NP	0.966
NIOOTHERM alloy NN	0.987
INCOTHERM alloy TD	0.966
NILO alloy 36	0.937
NILO alloy 42	0.934
NILO alloy 48	0.931
NILO alloy 55	0.933
NILO alloy K	0.928

Diameter mm	Weight kg/km*	Diameter mm	Weight kg/km*
0.200	0.277	1.90	25.0
0.212	0.312	2.00	27.7
0.224	0.348	2.12	31.2
0.236	0.386	2.24	38.6
0.250	0.433	2.36	38.6
0.265	0.487	2.50	43.3
0.280	0.544	2.65	48.7
0.300	0.624	2.80	54.4
0.315	0.688	3.00	62.4
0.335	0.778	3.15	68.8
0.375	0.975	3.35	77.8
0.400	1.11	3.75	97.5
0.425	1.25	4.00	111
0.450	1.40	4.25	125
0.475	1.56	4.50	140
0.500	1.73	4.75	156
0.530	1.95	5.00	173
0.560	2.17	5.30	195
0.600	2.50	5.60	217
0.630	2.75	6.00	250
0.670	3.11	6.30	275
0.710	3.50	6.70	311
0.750	3.90	7.10	350
0.800	4.44	7.50	390
0.850	5.01	8.00	444
0.900	5.62	8.50	501
0.950	6.26	9.00	562
1.00	6.94	9.50	626
1.06	7.79	10.0	694
1.12	8.70	10.6	779
1.18	9.66	11.2	870
1.25	10.8	11.8	966
1.32	12.1	12.5	1084
1.40	13.6	13.0	1172
1.50	15.6	13.5	1264
1.60	17.8	14.0	1359
1.70	20.0	14.5	1458
1.80	22.5	15.0	1560

\*To convert kg/km to lb/1000ft multiply by 0.672.

# WIRE SIZE CONVERSION CHART

Inch	mm	SWG	B & S	BWG
0.300	7.62	1		1
0.2893	7.35		1	
0.284	7.21			2
0.276	7.01	2		
0.259	6.58			3
0.2576	6.54		2	
0.252	6.40	3		
0.238	6.05			4
0.232	5.89	4		
0.2294	5.83		3	
0.220	5.59			5
0.212	5.38	5		
0.2043	5.19		4	
0.203	5.16			6
0.192	4.88	6		
0.1819	4.62		5	
0.180	4.57			7
0.176	4.47	7		
0.165	4.19			8
0.1620	4.11		6	
0.160	4.06	8		
0.148	3.76			9
0.1443	3.67		7	
0.144	3.66	9		
0.134	3.40			10
0.1285	3.26		8	
0.128	3.25	10		
0.120	3.05			11
0.116	2.95	11		
0.1144	2.91		9	
0.109	2.77			12
0.104	2.64	12		
0.1019	2.59		10	
0.095	2.41			13
0.092	2.34	13		
0.0907	2.30		11	
0.083	2.11			14
0.0808	2.05		12	
0.080	2.03	14		
0.072	1.83	15	13	15
0.065	1.65			16
0.0641	1.63		14	
0.064	1.63	16		
0.058	1.47			17

Inch	mm	SWG	B & S	BWG
0.0571	1.45		15	
0.056	1.42	17		
0.0508	1.29		16	
0.049	1.24			18
0.048	1.22	18		
0.0453	1.15		17	
0.042	1.07			19
0.0403	1.02		18	
0.040	1.02	19		
0.036	0.91	20		
0.0359	0.91		19	
0.035	0.89			20
0.032	0.81	21	20	21
0.0285	0.72		21	
0.028	0.71	22		22
0.0254	0.64		22	
0.025	0.63			23
0.024	0.61	23		
0.0226	0.57		23	
0.022	0.56	24		24
0.0201	0.51		24	
0.020	0.51	25		25
0.0180	0.457	26		26
0.0179	0.455		25	
0.0164	0.417	27		
0.0160	0.406			27
0.0159	0.400		26	
0.0148	0.376	28		
0.0142	0.361		27	
0.0140	0.356			28
0.0136	0.345	29		
0.0130	0.330			29
0.0126	0.320		28	
0.0124	0.315	30		
0.0120	0.305			30
0.0116	0.295	31		
0.0113	0.286		29	
0.0108	0.274	32		
0.0100	0.254	33	30	31
0.0092	0.234	34		
0.0090	0.229			32
0.0089	0.227		31	
0.0084	0.213	35		
0.0080	0.202		32	33

SWG: Standard Wire Gauge  
 B & S: Brown & Sharpe  
 BWG: Birmingham Wire Gauge



www.specialmetals.com

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