



aperam
made for life

Bars



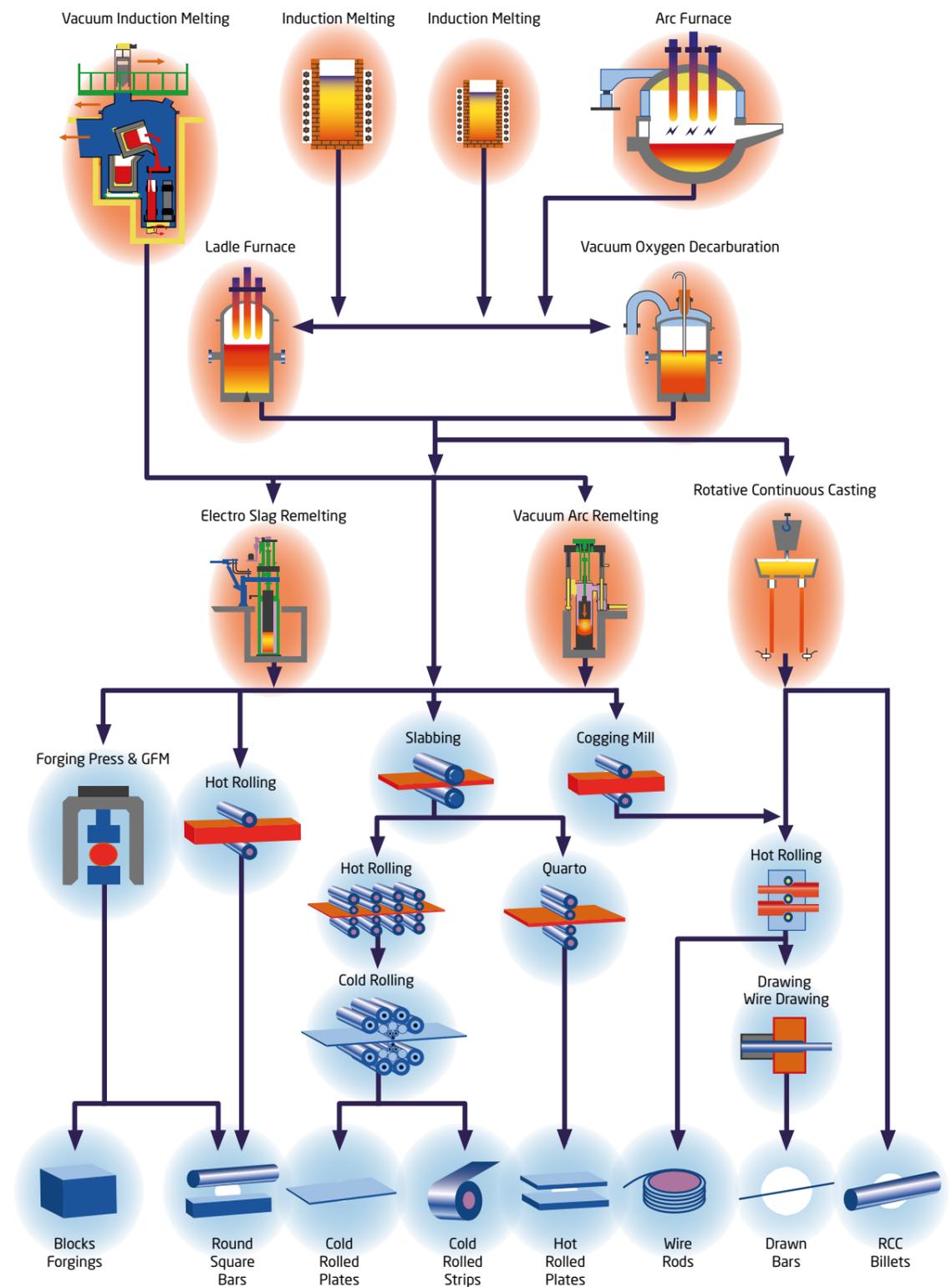
Part of the Aperam Group, a global player in flat stainless steel in Europe and Brazil, Aperam Alloys Imphy is a leading manufacturer of special stainless steels and nickel alloys.

For more than 100 years, the Pierre Chevenard research centre has been developing new products and applications to meet the most demanding market requirements.

Thanks to an integrated process from melshop to finished product, Aperam Alloys Imphy offers a wide range of grades available in all formats: billets, ingots, different types of bars, plates and slabs, as well as wire rods and cold rolled strips.

Aperam Alloys Imphy regularly invests in new equipment to ensure the very best level of service and quality.

Global Process



	Standard formats	Condition
Cold Drawn Bars	Ø 4 mm to Ø 20 mm	Cold drawn or centreless ground
Round Bars	Ø 20 mm to Ø 400 mm	Ground, Peeled or Turned
Square Bars	80 mm x 80 mm to 400 mm x 400 mm	Ground or fine ground
Plates *	Thickness 8 mm to 250 mm / Width 600 mm to 3000 mm	Pickled or sandblasted
Cold Rolled Strips *	Thickness 0.025 mm to 4.5 mm / Width up to 680 mm	

* Information about these formats is in their dedicated documentation

Name			Standards		Chemical analysis													
Grade	Werkstoff	UNS	Bar / Rod / Wire	Forging	Ni	Cr	Co	Mo	Fe	Cu	Nb	Al	Ti	C	S	Si	Mn	Others
Heat resistance and corrosion resistance alloys with good mechanical properties																		
NY600	2.4816	N06600	ASTM B166 AMS 5665, 5687	ASTM B564 AMS 5665														-
NY601	2.4851	N06601	ASTM B166	-	58-63	21-25	-	-	Bal.	<1	-	1-1,7	-	<0,10	<0,015	<0,5	<1	-
SY617	2.4663	N06617	ASTM B166 AMS 5887	ASTM B564 AMS 5887	>44,5	20-24	10-15	8-10	<3	<0,5	-	0,8-1,5	<0,6	0,05-0,15	<0,015	<1	<1	B < 0,006
SY625	2.4856 / 2.4831	N06625	ASTM B446 AMS 5666, 5837	ASTM B564 AMS 5666	>58	20-23	<1	8-10	<5	-	3,15-4,15	<0,4	<0,4	<0,1	<0,015	<0,5	<0,5	P < 0,015
SY718	2.4668	N07718	ASTM B637 AMS 5662, 5663, 5664, 5962	ASTM B637 AMS 5662, 5663, 5664	50-55	17-21	<1	2,80-3,30	Bal.	<0,30	4,75-5,5	0,2-0,8	0,6-1,15	<0,08	<0,015	<0,35	<0,35	P < 0,015 B < 0,006
SY750	2.4669	N07750	ASTM B637 AMS 5667, 5668, 5669, 5670, 5671, 5747, 5749	ASTM B637 AMS 5667, 5668, 5670, 5671, 5747, 5749	>70	14-17	<1	-	5-9	<0,5	0,7-1,20	0,4-1	2,25-2,75	<0,08	<0,01	<0,5	<1	-
SY276	2.4819	N10276	ASTM B574	ASTM B564	Bal.	14,5-16,5	<2,5	15-17	4-7	-	-	-	-	<0,01	<0,03	<0,08	<1	W = 3-4,5 V < 0,35 P < 0,04
SY 22	2.4602	N06022	ASTM B574	ASTM B564	Bal.	20-22,5	<2,5	12,5-14,5	2-6	-	-	-	-	<0,015	<0,02	<0,08	<1	W = 2,5-3,5 V < 0,35 P < 0,02
SY X	2.4665	N06002	ASTM B572 AMS 5754, 5798	AMS 5754	Bal.	20,5-23	0,5-2,5	8-10	17-20	<0,5	-	<0,5	<0,15	0,05-0,15	<0,03	<1	<1	W = 0,2-1 P < 0,04 B < 0,01
NY800	1.4876	N08800	ASTM B408 AMS 5766	ASTM B564	30-35	19-23	-	-	>39,5	<0,75	-	0,15-0,6	0,15-0,6	<0,1 0,05-0,1 0,06-0,1	<0,015	<1	<1,5	-
NY810 (800H)	1.4958	N08810	ASTM B408 AMS 5766	ASTM B564	30-35	19-23	-	-	>39,5	<0,75	-	0,15-0,6	0,15-0,6	0,05-0,1	<0,015	<1	<1,5	-
NY811 (800HT)	1.4959	N08811	ASTM B408 AMS 5766	-	30-35	19-23	-	-	>39,5	<0,75	-	0,25-0,6	0,25-0,6	0,06-0,1	<0,015	<1	<1,5	-
SY825	2.4858	N08825	ASTM B425	ASTM B564	38-46	19,5-23,5	-	2,5-3,5	>22	1,5-3	-	<0,2	0,6-1,2	<0,05	<0,03	<0,5	<1	-
SY218	-	S21800	ASTM A193	-	8-9	16-18		<0,75	Bal.					<0,10		3,5-4,5	7-9	N = 0,08-0,18
SY286	1.4944	S66286	ASTM A638 AMS 5726, 5731, 5732, 5734, 5737	ASTM A638 AMS 5731, 5732, 5734, 5737	24-27	13,5-16	<1	1-1,5	Bal.	<0,5	-	<0,35	1,9-2,35	<0,08	<0,025	<1	<2	V = 0,1-0,5 B = 0,001-0,01 P = 0,025
SY706	-	N09706	-	-	39-44	14,5-17,5			Bal.		2,5-3,3	<0,4	1,5-2	<0,06				
SY80A	2.4952 / 2.4631	N07080	ASTM B637	ASTM B637	Bal.	18-21	-	-	<3	-	-	0,5-1,8	1,8-2,7	<0,1	<0,015	<1	<1	-
SY926	1.4529	N08926	ASTM B649	-	24-26	19-21	-	6-7	Bal.	0,5-1,5	-	-	-	<0,02	<0,01	<0,5	<2	N = 0,15-0,25 P < 0,03
SY90	2.4632	N07090	-	-	Bal.	18-21	16-21		<2			1-2	2-3					
Thermal expansion controlled alloys																		
INVAR	1.3912	K93600 K93601 K93603	ASTM F1684 SEW385, A54-301	-	36	<0,25	<0,5	-	Bal.	-	-	<0,1	<0,1	<0,05	<0,015	<0,4	<0,6	Mg < 0,1 Zr < 0,1 P < 0,015
N42	1.3917	K94100	ASTM F30	-	41-43	<0,25	-	-	Bal.	-	-	<0,1	-	<0,05	<0,025	<0,3	<0,8	P < 0,025
DILVER P	1.3981	K94610	ASTM F15, F29 AMS 7726, 7727 SEW385, A54-301	AMS 7727	~29	<0,2	~17	<0,2	~53	<0,2	-	<0,1	<0,1	<0,04	-	<0,2	<0,5	Mg < 0,1 Zr < 0,1 Sum of Ti+Al+Mg+Zr < 0,2
Magnetic alloys																		
PERMIMPHY MUMETAL	-	N14080	ASTM A753	ASTM A753	79-82	<0,3	<0,5	3,5-6	Bal.	<0,3	-	-	-	<0,05	<0,010	<0,5	<0,8	P < 0,020
SUPRA 50	1.3922	K94800	ASTM F30	ASTM F30	46-49	<0,25	-	-	Bal.	-	-	<0,1	-	<0,05	<0,025	<0,3	<0,8	P < 0,025
AFK 1	-	K92650	ASTM A801	ASTM A801	<0,5	<0,5	26-28	<0,5	Bal.	<0,5	-	-	-	<0,1	<0,015	<0,35	<0,35	P < 0,015
AFK18	-	-	ASTM A801	-			18		Bal.								0,3	
AFK 502	-	R30005	ASTM A801	ASTM A801	<0,5	<0,5	46-50	<0,5	Bal.	<0,5	-	-	-	<0,1	-	<0,5	<0,5	V = 1,5-2,5
Nickel Alloys																		
Ni200	2.4066 2.4060	N02200	ASTM B160	ASTM B564	>99	-	-	-	<0,4	<0,25	-	-	-	<0,15	<0,01	<0,35	<0,35	-
Ni201	2.4061 2.4068	N02201	ASTM B160	-	>99	-	-	-	<0,4	<0,25	-	-	-	<0,02	<0,01	<0,35	<0,35	-
PHY400	2.4360	N04400	ASTM B164 AMS 4675	ASTM B564 AMS 4675	>63	-	-	-	<2,5	28-34	-	-	-	<0,3	<0,024	<0,5	<2	-
Electrical resistance alloys																		
GILPHY 80	2.4869	N06003	ASTM B344	-	Bal.	19-21	-	-	<0,5	-	-	-	-	<0,15	-	1,2-1,5	<1	-

Grade	Main Properties	Applications	Typical room-temperature mechanical properties				Physical properties at room temperature					Available forms
			Heat Treatment	Tensile Strength Rm (MPa)	Yield Strength Rp0,2 (MPa)	Elongation A%	Density (g/cm ³)	Thermal Conductivity (W.m ⁻¹ .°C)	Specific Heat (J.Kg ⁻¹ .°C)	Young Modulus (GPa)	Thermal Expansion (µm.m ⁻¹ .°C ⁻¹)	Bars, Cold Drawn Bar
Heat resistance and corrosion resistance alloys with good mechanicals properties												
NY600	Alloy with good high-temperature strength and oxidation resistance. Resistant to stress-corrosion cracking and caustic corrosion.	Chemical, food and pulp and paper industries. Thermal processing (furnace equipment,...). Automotive industry (spark plug,...). Pharmaceutical industry	Annealed	> 550	> 240	> 30	8,47	14,9	444	214	-	✓
NY601	Alloy with very good high-temperature strength up to 600 °C as well as good oxidation resistance at high temperature (hot gas). Good stress-corrosion cracking resistance in chloride environments.	Chemical and petrochemical Industries. Thermal processing (furnace equipment,...).	Solution annealed	> 550	> 205	> 30	8,11	11,2	448	206,5	-	✓
SY617	Alloy combining excellent high temperature strength (> 980 °C), oxidation resistance and stability. Also, resistant to carburizing gas and a range of very aggressive aqueous environments.	Energy (elements for gas turbines (combustion cane, pipe, transition tubes,...). Chemical industry (nitric acid production,...). Petrochemical industry. Gas turbines processing.	Solution annealed	> 655	> 240	> 35	8,36	13,4	419	211	-	✓
SY625	Alloy with excellent resistance to aggressive corrosive environments, notably to pitting, crevice corrosion, stress-corrosion cracking and high temperature oxidation. This alloy has high strength from cryogenic temperatures up to 815 °C and good creep-rupt	Chemical and petrochemical Industries (flanges, rings, valves, tubes, ...). Automotive industry. Oil and gas extraction. Environment (pollution control,...). Marine, aeronautic and nuclear engineering.	Annealed - Grade 1	> 827 > 690	> 414 > 276	> 30 > 40	8,44	9,8	410	207,5	-	✓
SY718	An age-hardenable alloy combining excellent high strength up to 700 °C with good corrosion resistance and excellent weldability. Exceptional creep-rupture strength at high temperature.	Aeronautic industry (blades and compressors discs, fasteners,...). Automotive industry (clamps, springs,...). Energy (Discs for gas turbines, spring for nuclear engineering,...). Tools for forging (shear knives, dies, swages,...). Chemical and petrochemical industrie.	Solution annealed and age-hardened	> 1240 > 1034	> 1034 > 827	> 8 > 25	8,21	-	435	199,9	-	✓
SY750	An age-hardenable alloy combining high strength up to 650 °C and creep-rupture strength up to 850 °C. Good oxidation and corrosion resistance.	Energy (elements for gas turbines, nuclear reactor, pressure vessels,...). Tools (spring, bolting,...). Aeronautic: elements for aircraft structure.	Solution annealed and age-hardened	> 1170 > 862 > 1100	> 795 > 550 > 690	> 15 > 8 > 25	8,28	-	-	213,7	-	✓
SY276	Excellent corrosion resistance in very aggressive environments and especially in chloride environment. Very good oxidation resistance up to 1000 °C. Resistant to localised attack and stress-corrosion cracking.	Chemical, petrochemical and aeronautic industries. Oil and gas industries (drilling, boring acids, ...). Pulp and paper industry. Pollution control (scrubbers and treatment of effluents).	Annealed	> 690	> 285	> 40	8,89	9,8	427	205	-	✓
SY 22	Excellent general corrosion resistance, located to intergranular corrosion and to stress-corrosion cracking. Optimal resistance to reducing and oxidizing environment.	Stripping or pickling equipments and acid production. Heat exchangers. Incineration systems and smoke discharge.	Solution annealed	> 690	> 310	> 45	8,61	-	381	209	-	✓
SY X	Alloy combining excellent high temperature oxidation resistance up to 1150 °C, good high strength and good resistance to stress corrosion cracking.	Components for gas turbine engine combustors, aircraft and marine. Thermal processing (furnace components,...). Nuclear engineering.	Solution annealed	> 660	> 240	> 30	8,25	11,6	461	205	-	✓
NY800	Alloy combining high tensile and corrosion resistance. Applications limited for temperature under 600 °C.	Industries: nuclear, chemical and petrochemical, food. Mechanical engineering. Thermal processing: furnace components (muffles, radiants tubes, pyrometric cane,...).	Annealed	> 515	> 210	> 30	7,94	11,5	460	196,5	-	✓
NY810 (800H)	Similar to alloy 800, but with improved creep and stress-rupture properties for applications at 600 °C to 950 °C. Good resistance to high temperature carburization, nitridation and oxidation.	Thermal processing Industries: nuclear, chemical and petrochemical, food. Mechanical engineering. Industries: nuclear, chemical and petrochemical, food.	Annealed	> 450	> 170	> 30	7,94	11,5	460	196,5	-	✓
NY811 (800HT)	Similar to 800H, but with a very precise chemical analysis which improves creep and stress-rupture properties. Temperature range of application: 700 °C to 1000 °C.	Industries: nuclear, chemical and petrochemical, food. Mechanical engineering. Thermal processing: furnace components (muffles, radiants tubes, pyrometric cane,...).	Annealed	> 450	> 170	> 30	7,94	11,5	460	196,5	-	✓
SY825	Alloy with excellent resistance to sulfuric and phosphoric acids. Also resistant to reducing and oxidizing acids, pitting, intergranular corrosion and stress-corrosion cracking.	Industries: Chemical, petrochemical, oil and gas (extraction components,...). Pollution control, pickling. Marine engineering (Construction, offshore, desalination, engine valves,...).	Annealed	> 586	> 241	> 30	8,14	11,1	440	194,1	-	✓
SY218	Good chloride pitting resistance, stress corrosion cracking resistance and crevice corrosion resistance.	Automotive valves. Fastener galling. Pins. Marine shafts.	Annealed	> 650	> 345	> 35	7,62	-	-	180	-	✓
SY286	An age-hardenable alloy with good oxidation resistance and strength up to 700 °C (notably to creep-rupture).	Automotive (turbo components, manifolds,...). Energy (turbine components,...). Oil and gas industries. Aeronautic industry (compressor valves, bolting,...).	Solution annealed and age-hardened	> 896 > 965	> 586 > 655	> 15 > 12	7,94	12,7	419	201	-	✓
SY706	Is a precipitation-hardenable alloy that provides high mechanical strength in combination with good fabricability. Good resistance to oxidation, and corrosion	Aerospace field. Turbine discs, shafts... Compressor discs and shafts... Engine mounts and fasteners.	Solution annealed and age-hardened	> 1280	> 990	> 19	8,05	12,5	444	210	-	✓
SY80A	An age-hardenable alloy for use at up to 815 °C. Good mechanical properties and outstanding resistance to creep at service temperature up to 815 °C. Excellent resistance to oxidizing atmospheres and high scaling resistance at elevated temperature.	Automotive (valves, clips, bolting, spring, intake valves,...). Elements for gas turbine and steam turbines (blades, discs, rings,...). Nuclear engineering (tube,...).	Solution annealed and age-hardened	> 930	> 620	> 20	8,19	11,2	448	219	-	✓
SY926	Alloy combining good localised corrosion resistance in a wide range of acids environments and good strength.	Seawater filtration, desalination. Offshore industry (flexible tube,...). Chemical industry (sulfuric acid production (distribution and cooling systems), phosphoric acids manufacture (heat exchangers, filters, evaporators,...), container for acids transport.	Annealed	> 650	> 295	> 35	8,1	12	415	193	-	✓
SY90	An aged hardening Ni-Cr-Co alloy. High tensile strength up to 600 °C with good creep-rupture properties up to 920 °C. Good corrosion resistance in wide oxidizing environment. It presents also a good resistance to cyclic heating.	Elements for gas turbine (disks, blades,...). Hot working tools.	Solution annealed and age-hardened	> 1200	> 800	> 25	8,18	11,47	446	204	-	✓
Thermal expansion controlled alloys												
INVAR	Alloy with very low thermal expansion from cryogenic temperatures up to 200 °C.	Aeronautic Mould, missile body. Liquid gas transport, cryogeny. Opticals device, Space and detection devices.	Annealed Stress relieved Bars are supplied wrought and not annealed	400 to 550 On wrought product	200 to 350 On wrought product	> 20 On wrought product	8,125	10	-	136	1,5	✓
N42	Alloy with thermal expansion similar to silicon, ceramics and hard glass.	Hermetic sealing for ceramics and glass.	Annealed Stress relieved Bars are supplied wrought and not annealed	400 to 550 On wrought product	200 to 350 On wrought product	> 20 On wrought product	8,11	10,5	-	150	5,3	✓
Dilver P	Alloy with thermal expansion similar to borosilicated glass and electronic ceramics.	Optoelectronics components. Electronic tubes (power, X-ray,...). Medical devices. Satellite components.	Annealed Bars are supplied wrought and not annealed	380 - 640 On wrought product	300 - 580 On wrought product	> 20 On wrought product	8,16	16,7	-	130	6	✓
Magnetic alloys												
PERMIMPHY MUMÉTAL	Very high permeability, linear and stress resistant. High purity. Low loss.	Magnetic shielding. Current sensors. High precision current transformer cores. Ground fault circuit breaker (relay parts).	Annealed Bars are supplied wrought and not annealed	> 480 On wrought product	> 200 On wrought product	> 30 On wrought product	8,74	19	460	-	12	✓
SUPRA 50	Permeability and high saturation magnetization. Good stampability.	Safety valves, resolvers, actuators. High precision current transformer cores. Ground fault circuit breaker (relay parts).	Annealed Bars are supplied wrought and not annealed	> 400 On wrought product	> 250 On wrought product	> 10 On wrought product	8,2	16,7	-	160	8,5	✓
AFK 1	Very high saturation magnetization. High ductility.	Motors parts with a good power/weight ratio (rotor and stator for on-board electrical system). Poles for electromagnets.	Annealed Bars are supplied wrought and not annealed	400 to 550 On wrought product	200 to 350 On wrought product	> 1 On wrought product	8	46	-	-	10,3	✓
AFK18	Very high saturation induction. High resistivity. High magnetostriction.	This grade is suitable for AC applications, such as high power density motors, generators and supply transformers.	Annealed Bars are supplied wrought and not annealed	400 to 550 On wrought product	200 to 350 On wrought product	> 1 On wrought product	7,9	57	-	-	10,5	✓
AFK 502	Very high saturation induction. High resistivity, low loss and low coercitive field.	Motor parts with a good power/weight ratio (rotor and stator for on-board electrical system). Poles for electromagnets. Magnetostrictive sensors.	Annealed Bars are supplied wrought and not annealed	400 to 550 On wrought product	200 to 350 On wrought product	> 1 On wrought product	8,12	29	-	200	9,5	✓
Nickel Alloys												
Ni200	Pure wrought Ni combining good mechanical properties, corrosion resistance, magnetic and magnetostrictive properties, useful thermal and electrical conductivities.	Food industry (foods transformation,...). Industries: chemical (Synthetic fiber and caustic soda treatment and production), aerospace and military (missile components,...). Desalination. Electronic components (magnetostrictif device,...).	-	> 415	> 105	> 35	8,89	70,3	456	205	-	✓
Ni201	Similar to nickel 200 but with a controlled carbon content to avoid intergranular damage at service temperature above 315 °C.	Food industry (foods transformation,...). Industries: chemical (Synthetic fiber and caustic soda treatment and production), aerospace and military (missile components,...). Desalination. Electronic components (magnetostrictive device,...).	-	> 345	> 70	> 40	8,89	70,3	456	207	-	✓
PHY400	Alloy Ni-Cu with high strength and exceptional corrosion resistance in a wide range of environment including seawater, dilute hydrofluoric and sulfuric acids, and alkalies. Service temperature up to 550 °C.	Marine and offshore industries (Valves and pumps components, axes, fixations, springs,...). Salt production, desalination. Chemical industry (valves, pumps, oilwell, heat exchanger,...), hydrocarbon transformation. Tube-shaped for water heater.	Annealed or Stress relieved	> 550	> 275	> 30	8,8	22	427	179,2	-	✓
Electrical resistance alloys												
GILPHY 80	A good high temperature stability and a well-adhering oxide scale even under cyclic conditions. Gilphy 80 has a maximum service temperature of 1200 °C.	Elements in domestic appliances and industrial equipment.	Annealed	> 600	> 300	> 35	8,35	-	-	-	-	✓



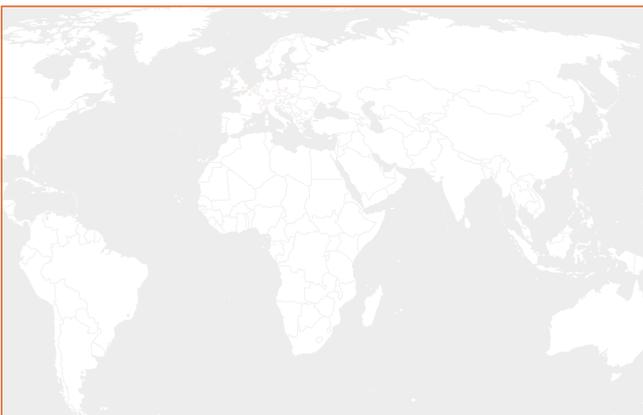
The Eiffel Tower is constructed with sixteen steel blocks made in Imphy

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