

Born from fire,
made to endure

NON - ORIENTED
ELECTRICAL STEELS



sij | acroni

Acroni is the largest slovenian steel manufacturer, which in order to produce steel recycles scrap in an electric arc furnace, casts it on continuous caster and rolls it into quality flat rolled steel products.

The company is specialised for the production of flat steel products and belongs among most important european suppliers of electrical steel. Besides non – oriented electrical steel, Acroni produces also stainless and carbon steel.

Constant development, improvement of processes and materials along with the introduction of a quality assurance system in accordance with ISO 9001, environmental management systems in accordance with ISO 14001 and occupational health and safety management systems in accordance with OHSAS 18001, are our guarantee for a constant quality level.

Our experts are always prepared to offer customers their assistance so that the excellent properties of our steels may be exploited to their full advantage and the satisfaction of the customer.

Acroni is a member of SIJ – SLOVENIAN STEEL GROUP.

Flexibility,
Experience,
Knowledge

NON-ORIENTED FULLY- PROCESSED ELECTRICAL STEELS

Electrical steels have special physical properties which make them suitable for application in the manufacture of electric equipments and appliances with rotating magnetic fields. The utilisation of fully processed steels is also widespread for construction of electrical static devices. Without electrical steels the production, transformation and utilisation of electrical energy would not be practical and would prove uneconomic.

WE PRODUCE TWO MAIN TYPES OF ELECTRICAL STEELS:

- **COLD ROLLED FULLY-PROCESSED ELECTRICAL STEELS**
- **COLD ROLLED SEMI-PROCESSED ELECTRICAL STEELS**

TRUSTED BY THE BEST

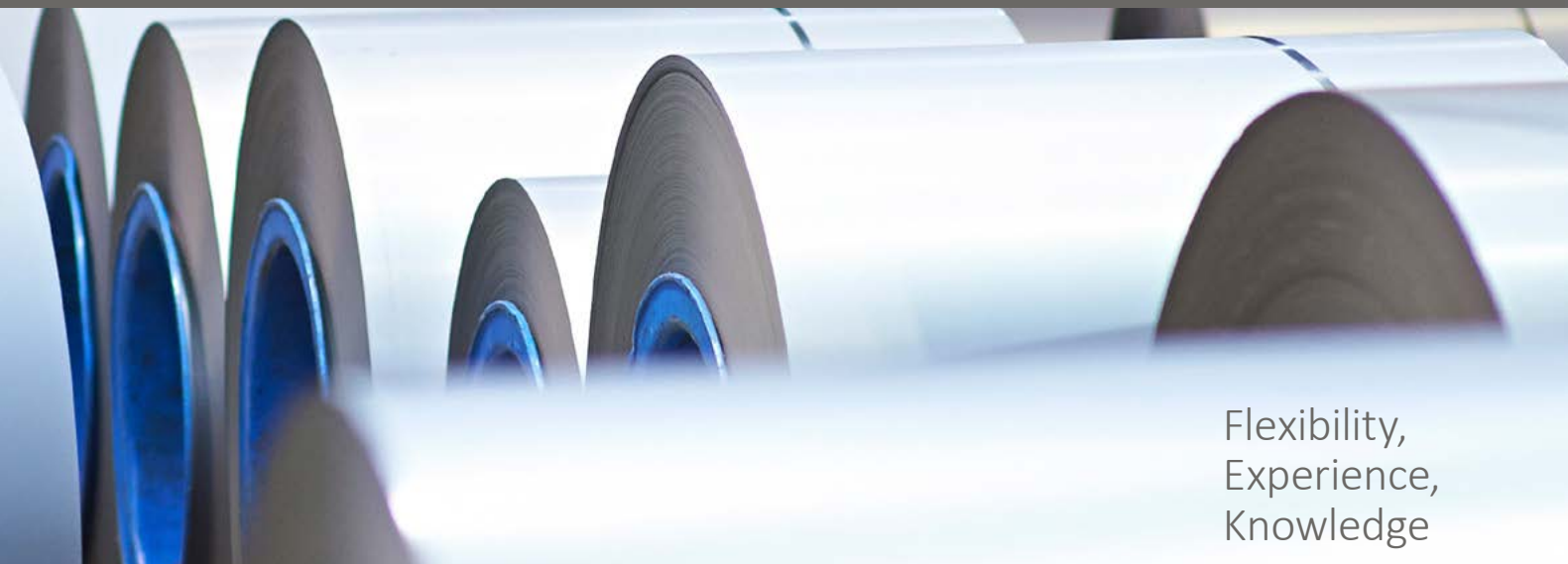


R. Bourgeois

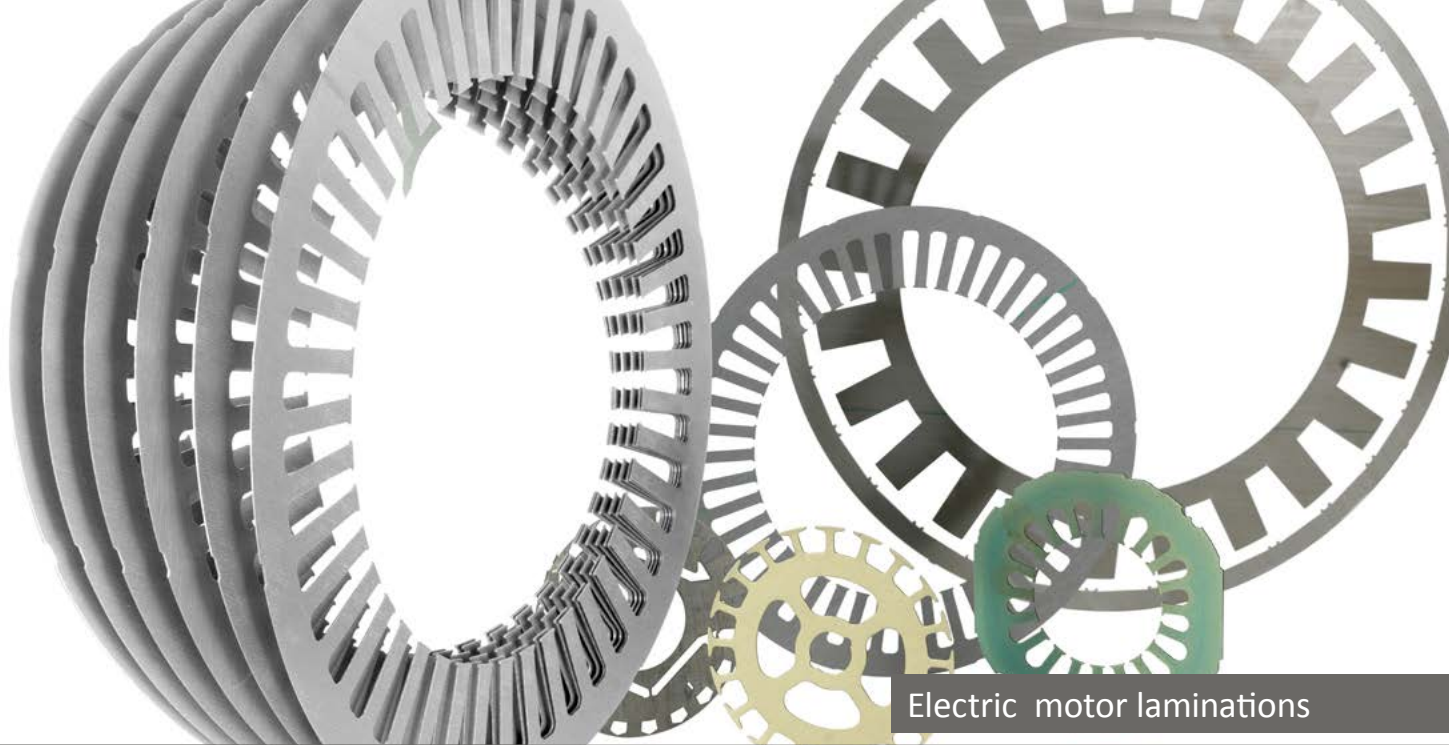
“Acroni is a historical partner in the silicon steel industry like the R.BOURGEOIS group ... and naturally we have been cooperating together for many years, especially for the demanding requirements of our industry, where we can find a common understanding with the mill and its teams.”

Domel

“Acroni is a reliable business partner, that enables with its adaptability and responsiveness adequate fulfillment of Domel requirements.”



Flexibility,
Experience,
Knowledge



Electric motor laminations



Wind power



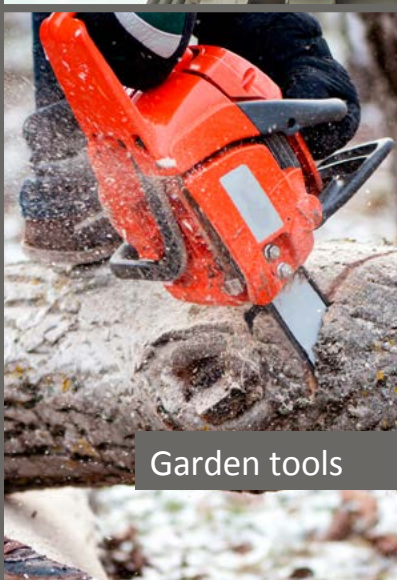
Domestic appliances



Voltage regulator transformers



Automotive



Garden tools



HVAC



Nuclear power



Fluorescent lamp ballasts

COLD ROLLED FULLY-PROCESSED ELECTRICAL STEELS

Cold rolled fully-processed electrical steels may be delivered without insulation or insulated on both sides with insulation in order to achieve desired properties for various fields of application (higher surface insulation resistance, improvement of punchability and corrosion resistance, annealing).

FULLY-PROCESSED ELECTRICAL STEELS -DINAMO (Guaranteed values)

Grade EN 10106	Nominal thickness (mm)	Specific total loss ^{1), 4)} (max.)		Magnetic polarisation (min.) for field strength A/m ^{2), 4)}			Stacking factor (min.)	Density (assumed) (kg/dm ³)
		at 1.5T (W/kg)	at 1T3) (W/kg)	2500 (T)	5000 (T)	10000 (T)		
M270-35A	0,35	2,7	1,10	1,49	1,60	1,70	0,95	7,65
M300-35A		3,0	1,20	1,49	1,60	1,70		7,65
M330-35A		3,3	1,30	1,49	1,60	1,70		7,65
M310-50A	0,50	3,1	1,25	1,49	1,60	1,70	0,97	7,65
M330-50A		3,3	1,35	1,49	1,60	1,70		7,65
M350-50A		3,5	1,50	1,50	1,60	1,70		7,65
M400-50A		4,0	1,70	1,53	1,63	1,73		7,70
M470-50A		4,7	2,00	1,54	1,64	1,74		7,70
M530-50A		5,3	2,30	1,56	1,65	1,75		7,70
M600-50A		6,0	2,60	1,57	1,66	1,76		7,75
M700-50A		7,0	3,00	1,60	1,69	1,77		7,80
M800-50A		8,0	3,60	1,60	1,70	1,78		7,80
M400-65A	0,65	4,0	1,70	1,52	1,62	1,72		7,65
M470-65A		4,7	2,00	1,53	1,63	1,73		7,65
M530-65A		5,3	2,30	1,54	1,64	1,74		7,70
M600-65A		6,0	2,60	1,56	1,66	1,76		7,75
M700-65A		7,0	3,00	1,57	1,67	1,76		7,75
M800-65A		8,0	3,60	1,60	1,70	1,78		7,80

1) In accordance with IEC 60404-8-4 and EN 10106, the values are specified and guaranteed for magnetic polarisation at 1.5 T unless otherwise agreed

2) In accordance with IEC 60404-8-4 and EN 10106, the values are specified and guaranteed for field strength at 2500 A/m, 5000 A/m and 10000 A/m unless otherwise agreed

3) These are only informative values

4) Valid for testing in A. C. field in the 25 cm Epstein frame according to IEC 60404-2



FULLY-PROCESSED HIGH PERMEABILITY ELECTRICAL STEELS - PERMAG FP (Guaranteed values)

ACRONI Grade	Nominal thickness (mm)	Specific total loss ²⁾ (max.)		Magnetic polarisation (min.) for field strength A/m ²⁾		
		at 1.5T (W/kg)	at 1T3) (W/kg)	2500 (T)	5000 (T)	10000 (T)
PERMAG						
M330-35A-H	0,35	3,30	1,30	1,55	1,64	1,76
M400-50A-HP	0,50	4,00	1,70	1,61	1,70	1,81
M530-50A-HP		5,30	2,30	1,63	1,72	1,83
M600-50A-HP		6,00	2,60	1,64	1,73	1,84
M700-50A-HP		7,00	3,00	1,67	1,76	1,78
M470-65A-HP	0,65	4,70	2,00	1,58	1,67	1,79
M600-65A-HP		6,00	2,60	1,62	1,71	1,82
M700-65A-HP		7,00	3,00	1,65	1,73	1,84
M800-65A-HP		8,00	3,60	1,67	1,76	1,87

1) These are only informative values

2) Valid for testing in A. C. field in the 25 cm Epstein frame according to IEC 60404-2

Flexibility,
Experience,
Knowledge



INSULATION COATINGS ON FULLY-PROCESSED ELECTRICAL STEELS

AISI Designation ASTM A976	C - 6	C - 3	C-5
Thermal class (IEC 60085)	H	H	H
Thickness of layer on each side (µm) (ISO 2178)	1 to 6	0,5 to 3	0,5 to 1,5 1,5 to 3,0
Composition	ORGANIC WITH FILLERS	ORGANIC WITHOUT FILLERS	ORGANIC/INORGANIC WITH FILLERS
Surface insulation resistance ¹⁾ (Ohm cm ²) (ASTM A717)	40 to 500	up to 15	5 to 70
Heat resistance	180°C ²⁾	180°C ²⁾	180°C ²⁾ / 850°C ³⁾
Influence on punchability	FAVOURABLE	VERY FAVOURABLE	VERY FAVOURABLE
Influence on weldability	CONDITIONAL	CONDITIONAL	GOOD
Resistance to medium ⁴⁾	GOOD	GOOD	GOOD
Colour ⁵⁾	LIGHT GREY TO DARK GREY	YELLOW	COLOURLESS TO GREEN

1) Surface insulation resistance depends on coating thickness

2) In air long time (testing for 20000 hours at a given temperature in accordance with IEC 60085)

3) In protective gas atmosphere (as stress-relief annealing)

4) It relates to the resistance to the most of lubricants, refrigerating mediums and oils. The varnish producer tests the resistance to the specific medium only after the customer's requirement

5) Colour shades depend on the coating thickness and type of varnish applied

COMPARISON OF GRADE DESIGNATIONS

FULLY-PROCESSED ELECTRIC AL STEELS

EN 10106 (2007)	IEC 60404-8-4 (1998)	AISI*	JIS C 2552 (2000)	GOST* 21 427 0-75
M250-35A	M250-35A 5	M 15	35A250	2411
M270-35A	M270-35A 5	M 19	35A270	2412
M300-35A	M300-35A 5	M 22	35A300	2411
M330-35A	M330-35A 5	M 36	—	—
M330-50A	M330-50A 5	M 27	—	—
M350-50A	M350-50A 5	M 36	50A350	2411
M400-50A	M400-50A 5	M 43	50A400	2312
M470-50A	M470-50A 5	—	50A470	2311
M530-50A	M530-50A 5	M 45	--	2212
M600-50A	M600-50A 5	—	50A600	2112
M700-50A	M700-50A 5	M 47	50A700	—
M800-50A	M800-50A 5	—	50A800	2111
M400-65A	M400-65A 5	M 27	—	—
M470-65A	M470-65A 5	M 43	—	—
M530-65A	M530-65A 5	—	—	2312
M600-65A	M600-65A 5	M 45	—	2212
M700-65A	M700-65A 5	—	—	2211
M800-65A	M800-65A 5	—	65A800	2112



ROTATING MACHINES

- Large rotating machines (2 and 4 poles)
- Large rotating machines (many poles)
- Small generators
- Medium rotating machines
- Hermetic motors
- General duties A.C. electric motors, domestic appliance motors
- Small D.C. intermittent motors, compressor motors

STATIC MACHINES

- Audio transformers
- Saturable reactors and magnetic amplifiers
- Voltage regulator transformers, distribution transformers
- Power transformers
- Current transformers
- Welding transformers
- Fluorescent lamp ballasts
- Magnetic switches
- Pole pieces and relay cores

GENERAL INFORMATION

STRIPS

Width of coil	30 do 1000 mm
Inside nominal diameter	508 mm (20")
Outside nominal diameter	1300 mm (max)

DIMENSIONS AND WEIGHTS

	Coil weight (kg/mm of width)	Outside diameter (mm)
Entire coil	6 to 8,6	1100 to 1300
1/2 coil	3 to 4,5	870 to 1000
1/3 coil	2 to 2,9	770 to 850

DIMENSIONS AND WEIGHTS

TOLERANCES ON NOMINAL WIDTH		TOLERANCES ON NOMINAL THICKNESS	
Nominal width "w" (mm)	Tolerance (mm)	Nominal thickness (mm)	Tolerance (mm) %
w ≤ 150	0 to +0,2	0,35	±0,03 ±8
150 < w ≤ 300	0 to +0,3	0,50	±0,04 ±8
300 < w ≤ 600	0 to +0,5	0,65	±0,04 ±6
600 < w ≤ 1000	0 to +1,0	1,00	±0,06 ±6

SHEETS

Cut lengths	600 to 6000 mm
Cut length tolerances	0 do + 0,5%
Widths of sheets	420 do 1000 mm
Package weights	1000 do 2500 kg
Dimensional and geometrical tolerances are in accordance with standards	EN 10106, EN 10341

OUTSIDE DIAMETER IN DEPENDENCE OF COIL WEIGHT

