



GINDRE



We have been transforming copper into power for two centuries...

Recent decades have seen the Group, a family business at the start, rise into the foremost rank of world suppliers to the electricity industry.

The production units make bars, profiles and copper wire, keeping in step with the technological evolution in extrusion, drawing and industrial engineering, to achieve our present capacity and production quality, meeting the most demanding standards.

At the same time, the company has logically extended its expertise to design and manufacture based on its semi-finished products using increasingly sophisticated components.

This total industrial process, relying on highly customer-orientated distribution logistics, is today established in ten countries through subsidiaries and partners and more than 500 people.



The world specialist, making conductors for electrical equipment, supplies the greatest international groups and also local companies.



Wherever the current is passing we find the copper semis and components of GINDRE :

- Production : rotor bars, poles bars ...
- Transport : connectors, busbars systems...
- Transformation : bushing bars, connections...
- Equipment : punched bars, bus bars, flexibles...
- Apparatus : fix and moving contacts, fuses bases, fuses knives...
 - Motors : rotor bars, coils, connections...



A TECHNOLOGICAL GROUP

From the copper bar to the most sophisticated component... total mastery of the industrial process.

Technical excellence, skill, reliability and flexibility are the four points of commitment running throughout a process that brings together raw material, metallurgy, industrial components and distribution. The Gindre network complies with the **UL** and **ISO** standards, and the **RoHS** and **Reach** regulations.

Long runs or short runs... An organization capable of global and local solutions.

For more effectiveness, the French Group has globalized its production and services and centralized all the administrative and accounting procedures. The aim is to help customers concentrate on their competitiveness with reduced costs and rationalized supplies.

Throughout the world... A commercial involvement to accompany projects.

For best possible response to the constant development requirements of organisations, teams of travelling and office-based sales people are dedicated to each area of the world. They monitor projects from the design phase right up to delivery, providing an effective link between the demands of industry and the talents of the engineers and technicians. With their great experience and skills as professionals working with copper, they all work together to guarantee the quality of products and services.



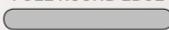
- Production
- Production and distribution
- Distribution
- Sales office



THE BARS



FLAT

TECHNICAL SPECIFICATIONS		
Chemical and mechanical characteristics in accordance with the european standards (see tables page 22)		
SIZES		
Width from 5 to 250 mm	Thickness from 1 mm to 70 mm	Cross section 7500 mm ²
RADIUS		
SQUARE EDGE 	RADIUS EDGE 	FULL ROUND EDGE 
LENGTH		
Up to 9500mm (depending the cross section), with a standard length tolerance of 100 mm. Upon demand this length tolerance could be 3 mm. Standard tolerances for straightness and edgewise bow : 1,5 mm/m		
PLATING Tin plating 1 to 20 microns		

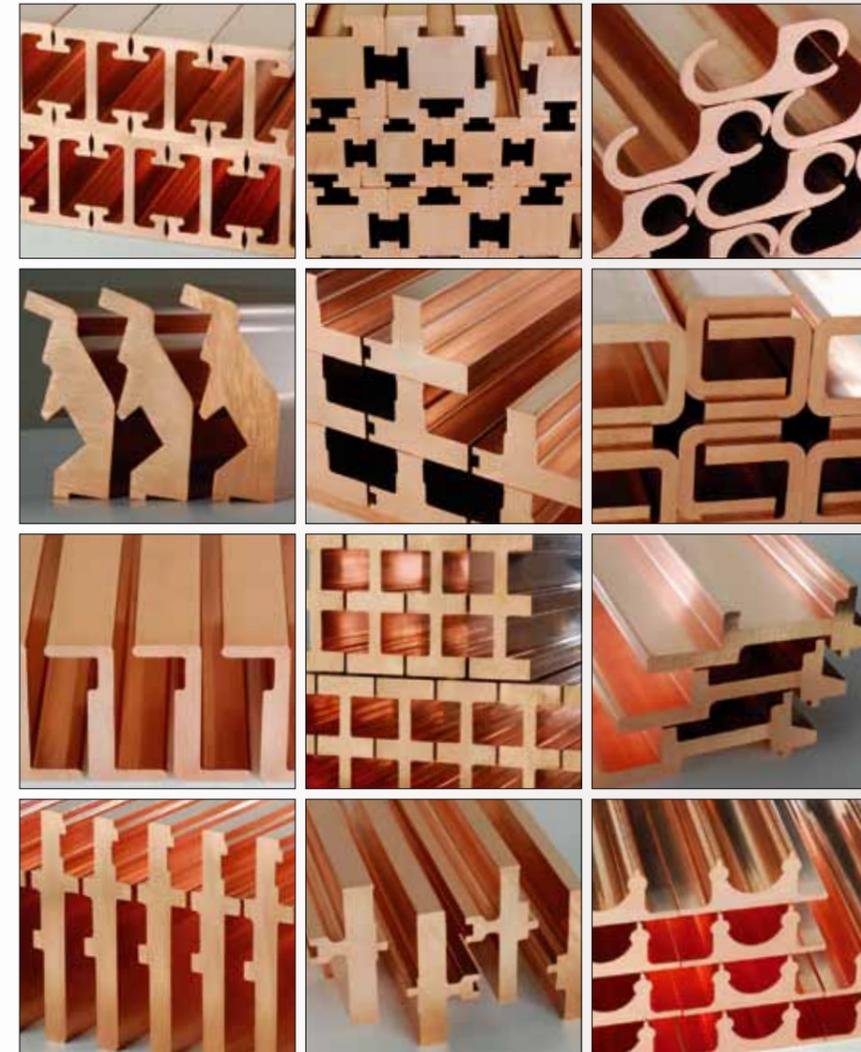
ROUND

SIZES			
Diameter	Length	Tolerance on length	
		Standard	Shorten
From 5 mm up to 85 mm	Up to 6400 mm	50 mm	3 mm

SQUARES AND HEXAGONALS

SIZES				
Squares	Hexagonals	Length	Tolerance on length	
			Standard	Shorten
From 5 mm up to 70 mm	From 8 mm up to 60 mm	Up to 6400 mm	50 mm	3 mm

TECHNICAL PROFILES MADE TO SPECIFICATION



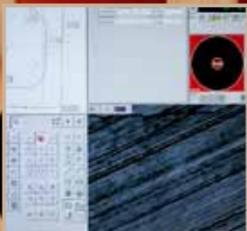
CROSS SECTIONS from 50 mm² up to 7 500 mm²

LENGTH up to 9 500 mm (depending the cross section).

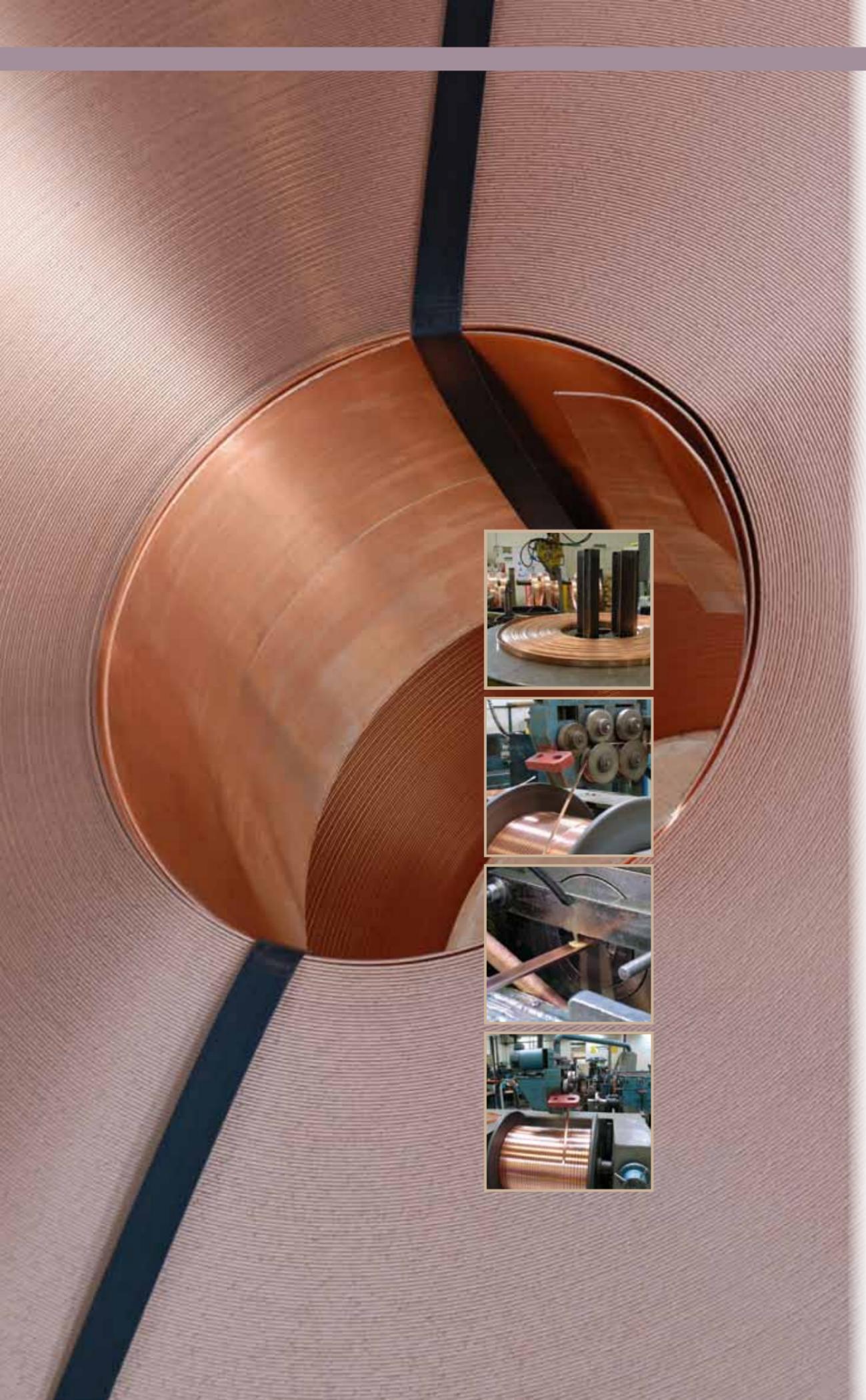
EVERY PROFILE is designed according to the plan provided.
All characteristics : mechanical, dimensional, surface quality, contact surface, surface treatment, etc... are included in precise specifications.

OUR INTEGRATED WORKSHOPS, for designing and making tools for extruding and drawing profiles, are one-hundred percent responsive.

CERTAIN PROFILES can also be delivered in rolls, depending on their format and nominal section.



FLAT IN COIL

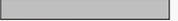
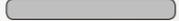


SIZES		
Width from 20 up to 120 mm		
Thickness from 1 up to 12 mm		
Maximum cross section 1440 mm ²		
RADIUS		
SQUARE EDGE 	RADIUS EDGE 	FULL ROUND EDGE 
PLATING		
Tinning from 1 to 20 microns.	Silver plating from 1 to 5 microns.	
Total or partial plating		
PACKING		
Pancake coils with 400 up to 550 mm ID (other possibilities upon request)		
Standard weight : 30 up to 450 kgs upon the cross section.		

FLAT AND ROD WIRES



FLAT WIRES

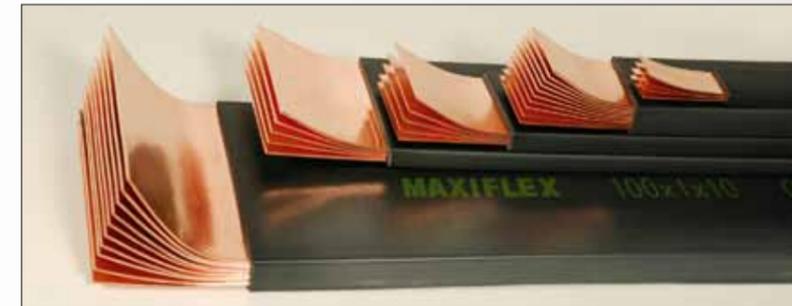
SIZES		
Width from 1,85 up to 35 mm	Thickness from 0.5 up to 8 mm	Cross section from 3,5 up to 2500 mm ²
RADIUS		
SQUARE EDGE 	RADIUS EDGE 	FULL ROUND EDGE 
Standard tolerance : +/-1%, with a minimum of 0.025 mm		
PLATING		
Tinning 1 to 20 microns.	Silver plating 1 to 5 microns.	

WIRE ROD

Gindre is the specialist for the cold stamping wire rod

SIZES : diameter from 0.5 up to 15 mm.
PLATING : tinning, silver plating...
PACKING : pancake coils, traverse wound coils, bobbins
WEIGHT : up to 1500 kgs

MAXIFLEX ISOLATED FLEXIBLE BARS



TECHNICAL SPECIFICATIONS BARS

Standard length	2000 mm (-0/+5 mm), up to 4000 mm upon request
Strip thickness	0,8 and 1 mm
Strip width	from 9 up to 100 mm
Number of strips	from 2 up to 10
Marking	MAXIFLEX brand and size (width X thickness X number of strips)

COPPER

Cu-ETP with a minimum copper content of 99.90%

Specifications	upon NFA 51 050, EN 13599
Conductivity	>100 % IACS
HV	< 50
Tensile strength	Rm > 200 N/mm ²
Elongation	after break : > 35 %
Resistivity	0,01724 Ω xm/mm ² at 20 °C

INSULATING MATERIAL

Black color insulating PVC self-extinguish

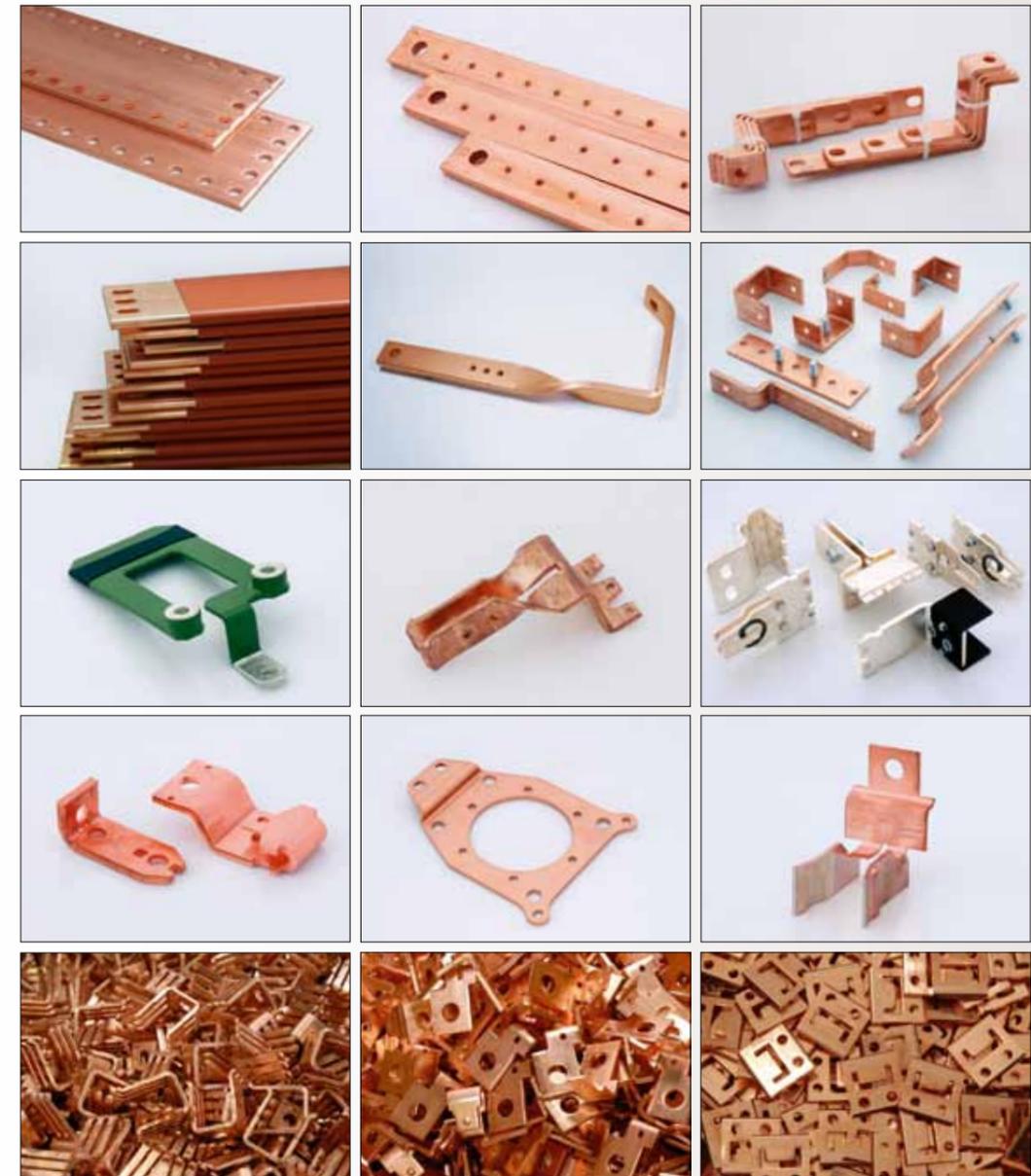
Thickness	1,5 - 2 mm
Specifications	upon BS 6746, DIN EN 50363, UL 94 V0
Elongation	> 200 %
Tensile strength	> 15 N/mm ²

ELECTRICAL CHARACTERISTICS

Dielectric rigidity	20 kV / mm
Tension of use	1000 V AC / 1500 V DC
Temperature of use	-40° up to + 105°C

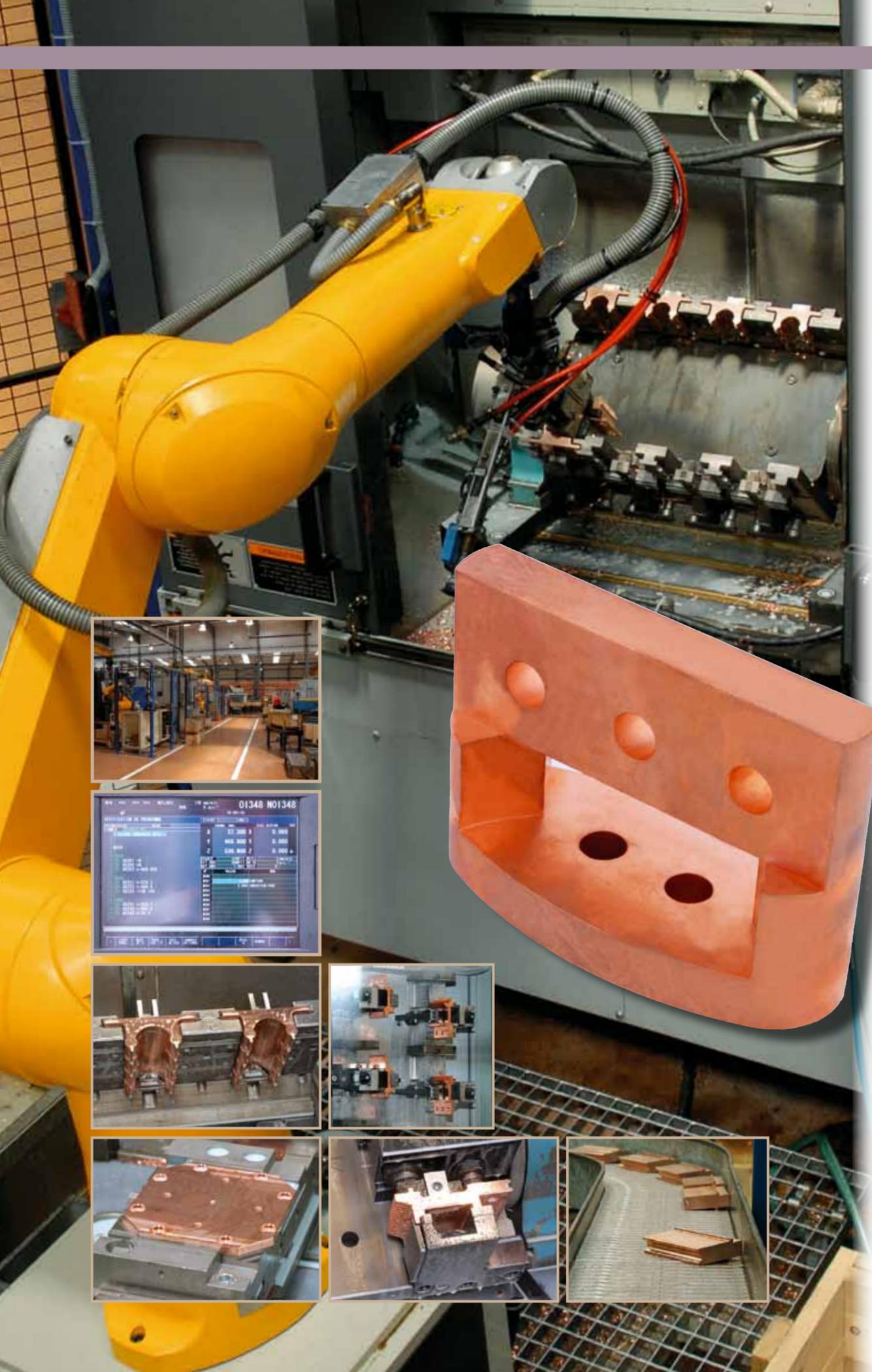
COMPONENTS MADE TO SPECIFICATION

PUNCHING, BENDING/FOLDING, CUTTING...



Whether a firm wants to outsource production or is looking for ready-to-use components, the Gindre integrated industrial organization (from the raw material to the component) and all technologies available in workshops throughout Europe and the world, are capable of providing :

- Readily available parts, perfectly matching technical needs and requirements
- Savings on "supply chain", making the best rational use of materials and their procurement
- Reduced stock and administrative formalities...



COMPONENTS MADE TO SPECIFICATION MACHINING...



Starting from specifications, the design teams define the material suitable for the need and the basic profile, which will most often be made specifically. They establish and design the best processes and tools suitable for creating the expected part, whether traditional or special.

To do this, they unite technical skill and production resources, traditional or hi-tech, guided by experienced professionals.

Among the technologies available are : cutting, perforated blanks, punching, bending/folding, turning, tapping, digital machining, sheet nibbling, water-jet cutting, brazing, cladding, surface treatment (silvering, tinning, nickel plating, gilding), epoxy, inserts, assembly, kits, etc...

A WORLDWIDE NETWORK OF LOGISTICS AND DISTRIBUTION CENTRES



Gindre has developed a powerful integrated logistics organization to bring its customers effective and detailed services :

- On-time delivery of products,
- Availability of semi-finished products close as possible to scheduled requirements
- Supplies from dedicated buffer stock
- Wide choice of conductors (copper with tellurium, chromium, zirconium, sulphur, aluminium, brass, etc...)



QUALITY OF COPPER

CHEMICAL COMPOSITION											
Material designation		Composition %								Other elements (see note)	
		Element	Cu	Ag	Bi	O	P	Pb	Total	Excluding	
Symbol	Number										
Cu-ETP	CW004A	min. max.	99,90 ⁽¹⁾ -	-	0,0005	-	0,040 ⁽²⁾	-	0,005	0,03	Ag, O
Cu-FRHC	CW005A	min. max.	99,90 ⁽¹⁾ -	-	-	-	0,040 ⁽²⁾	-	-	0,04	Ag, O
Cu-OF	CW008A	min. max.	99,95 ⁽¹⁾ -	-	0,0005	-	- ⁽³⁾	-	0,005	0,03	Ag
CuAg 0,04	CW0011A	min. max.	Balance -	0,03 0,05	0,0005	-	0,040	-	-	0,03	Ag, O
CuAg 0,07	CW0012A	min. max.	Balance -	0,06 0,08	0,0005	-	0,040	-	-	0,03	Ag, O
CuAg 0,10	CW0013A	min. max.	Balance -	0,08 0,12	0,0005	-	0,040	-	-	0,03	Ag, O
CuAg 0,04P	CW0014A	min. max.	Balance -	0,03 0,05	0,0005	-	- ⁽³⁾	0,001 0,007	-	0,03	Ag, P
CuAg 0,07P	CW0015A	min. max.	Balance -	0,06 0,08	0,0005	-	- ⁽³⁾	0,001 0,007	-	0,03	Ag, P
CuAg 0,10P	CW0016A	min. max.	Balance -	0,08 0,12	0,0005	-	- ⁽³⁾	0,001 0,007	-	0,03	Ag, P
CuAg 0,04(OF)	CW0017A	min. max.	Balance -	0,03 0,05	0,0005	-	- ⁽³⁾	-	-	0,0065	Ag, O
CuAg 0,07(OF)	CW0018A	min. max.	Balance -	0,06 0,08	0,0005	-	- ⁽³⁾	-	-	0,0065	Ag, O
CuAg 0,10(OF)	CW0019A	min. max.	Balance -	0,08 0,12	0,0005	-	- ⁽³⁾	-	-	0,0065	Ag, O
Cu-PHC	CW0020A	min. max.	99,95 ⁽¹⁾ -	-	0,0005	-	- ⁽³⁾	0,001 0,006	0,005	0,03	Ag, P
Cu-HCP	CW0021A	min. max.	99,95 ⁽¹⁾ -	-	0,0005	-	- ⁽³⁾	0,002 0,007	0,005	0,03	Ag, P

NOTE : the balance of the other elements (excluding copper) is defined as the sum of Ag, As, Bi, Cd, Co, Cr, Fe, Mn, Ni, O, P, Pb, S, Sb, Se, Si, Sn, Te and Zn, excluding the other elements for which the value is already indicated.
⁽¹⁾ Including silver, up to a maximum of 0.015%.
⁽²⁾ An oxygen content of 0.060% is permitted, with a prior agreement between the seller and the buyer.
⁽³⁾ Then oxygen content must be in accordance with the hydrogen embrittlement test, of EN 1976.

MECHANICAL CHARACTERISTICS																			
Designation		Size mm								Hardness		Tensile strength Rm N/mm ²	Yield point 0,2 % Rp 0,2 N/mm ²	Elongation					
		Material	Hardness	Round, square hexagonal			Flat			HB	HV			A100 mm %	A %				
Symbol	Number			from	over of	up to and including	from	over of	up to and including			min.	max.			min.	max.		
		D	2	-	80	0,5	-	40	1	-	200	Drawn product without any mechanical characteristics.							
Cu-ETP	CW004A	R200*	2	-	80	0,5	-	40	1	-	200	35	65	35	65	-	-	25	35
Cu-FRHC	CW005A																		
Cu-OF	CW008A	H065	2	-	80	0,5	-	40	1	-	200	65	90	70	95	-	-	-	-
CuAg 0,04	CW011A	R250	2	-	10	1	-	10	5	-	200	-	-	-	-	250	min. 200	8	12
CuAg 0,07	CW012A	R250	-	10	30	-	-	-	-	-	-	-	-	-	-	250	min. 180	-	15
CuAg 0,10	CW013A	R230	-	30	80	-	10	40	-	10	200	-	-	-	-	230	min. 160	-	18
CuAg 0,04P	CW014A																		
CuAg 0,07P	CW015A	H085	2	-	40	0,5	-	20	1	-	120	85	110	90	115	-	-	-	-
CuAg 0,10P	CW016A	H075	-	40	80	-	20	40	-	20	160	75	100	80	105	-	-	-	-
CuAg 0,04(OF)	CW017A	R300	2	-	20	1	-	10	5	-	120	-	-	-	-	300	min. 260	5	8
CuAg 0,07(OF)	CW018A	R280	-	20	40	-	10	20	-	10	120	-	-	-	-	280	min. 240	-	10
CuAg 0,10(OF)	CW019A	R260	-	40	80	-	20	40	-	20	160	-	-	-	-	260	min. 220	-	12
Cu-PHC	CW020A																		
Cu-HCP	CW021A	H100	2	-	10	0,5	-	5	1	-	120	100	-	110	-	-	-	-	-
		R350	2	-	10	1	-	5	5	-	120	-	-	-	-	350	min. 320	3	5

NOTE : 1 N/mm² is equivalent in 1 MPa.
* Annealing



THE GROUP WORLD-WIDE

PRODUCTION

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