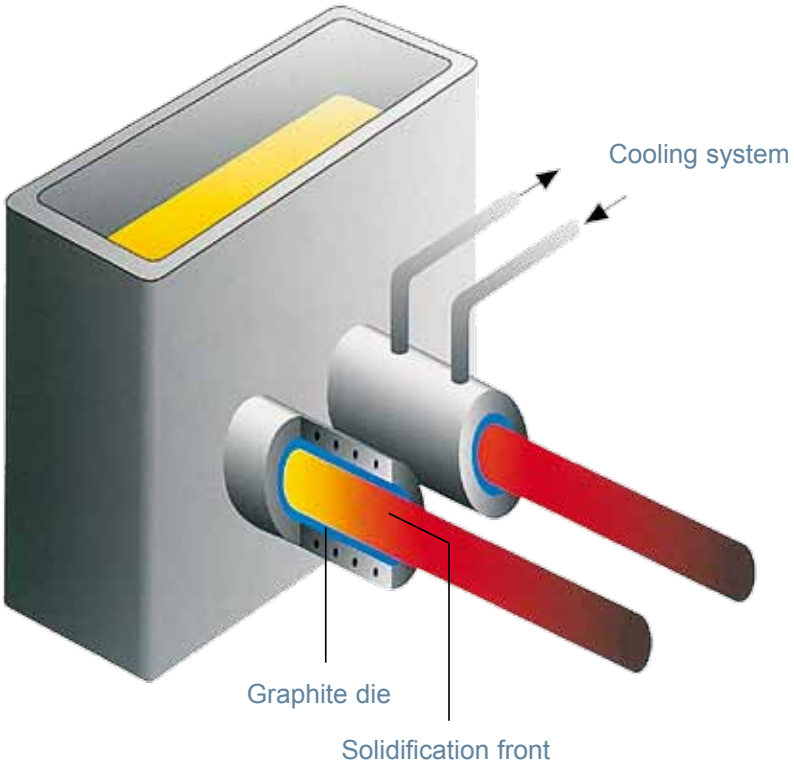
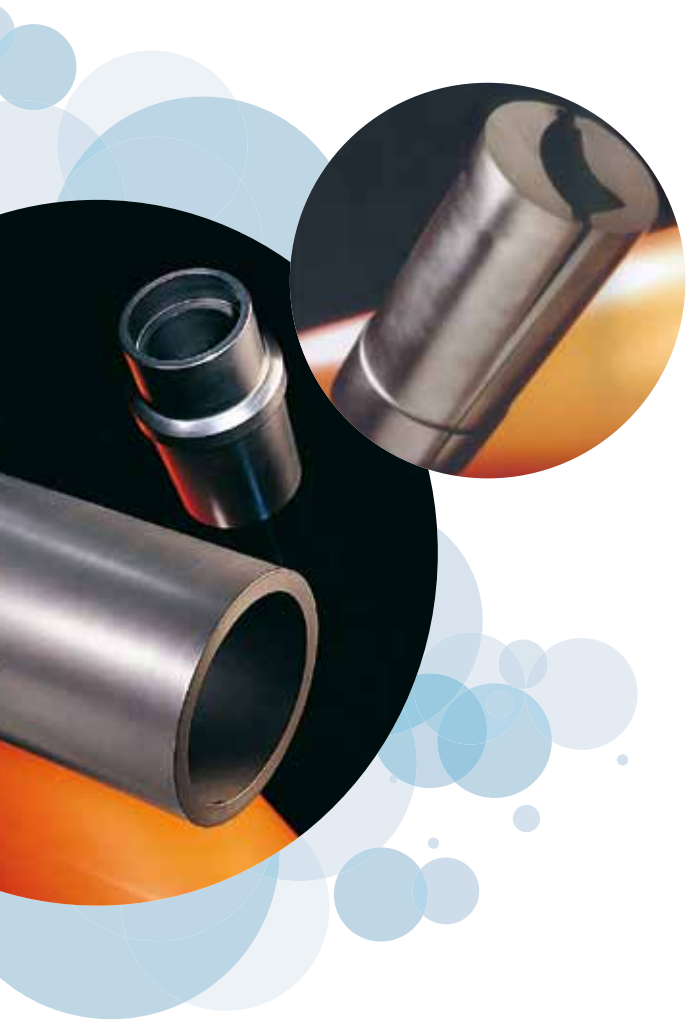
SPECIALITY GRAPHITE MATERIALS

FOR CONTINUOUS CASTING

MERSEN

HORIZONTAL CONTINUOUS CASTER





CONTINUOUS CASTING

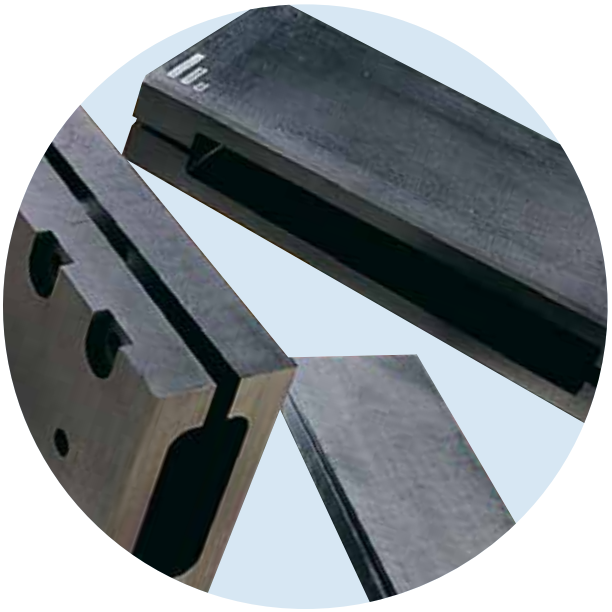
is a metallurgical process which allows continuous control of the transformation from a liquid metal to a solid state in order to directly obtain semi-finished products like:

- wires,
- rods,
- tubes,
- strips,
- custom sections.

The graphite “die” used in this transformation, permits:

- the shaping of the metal,
- the heat extraction necessary to transform the metal from liquid to solid state.

The selection of the best graphite grade for your application...



… depends mainly on the composition of the alloy to be cast: grey iron requires a graphite resistant to wear abrasion; brass, a graphite relatively dense but with enough open porosity to allow zinc to evaporate in the area of the solidification front; non-ferrous alloys containing elements like nickel or cobalt need high density graphite to reduce chemical attack of the graphite die...

The other parameters which determine the choice of the grade are:

- the size and shape of the cast section,
- the speed of casting,
- the total amount of alloy to cast,
- casting orientation (i.e, vertical or horizontal).

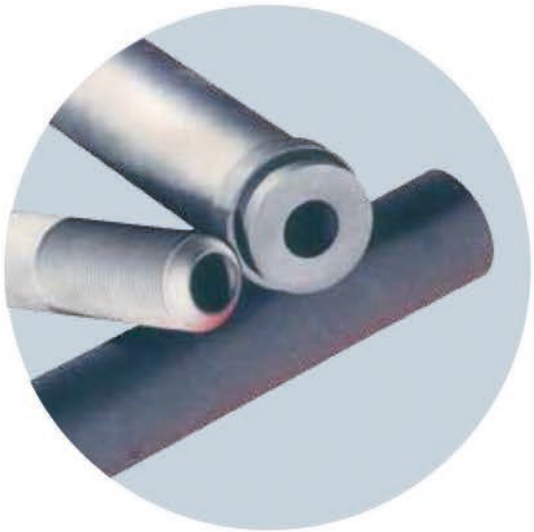
In addition to the graphite grade chosen, the casting results are also a function of die design, quality of machining, and the specific characteristics of the casting installation. Our grades have been developed in conjunction with foundrymen to obtain the proper blend of physical characteristics for continuous casting. We can provide technical services to assist you in finding a suitable graphite for your application. However, in many cases optimal grade selection can be made only through actual trials.
The following application chart should be used only as an indicative guide for grade selection.

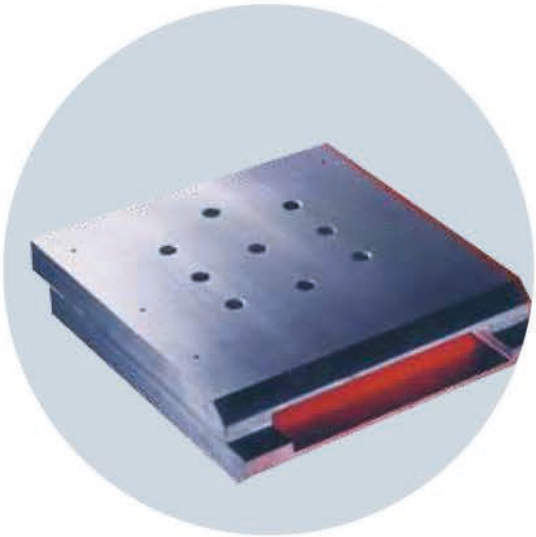
Recommended grades

Cast alloy	Wire casting	Billet casting	Strip casting	Tube casting
Grey and ductile iron	-	1940	1940	1940
Brass (Cu-Zn)	2236 - 2554	2236 - 2554	2236 - 2554	1940
Bronze	2236 - 2554	2236 - 2554	2236 - 2554	2236 - 2554
Phosphorus bronze	2220 - 2236	2220 - 2236	2220 - 2236	2236 - 2220 (Core)
Maillechort (Cu-Zn-Ni) Nickel-silver	2230 - 2554	2230 - 2554	2554	2220 - 2236
Nickel-copper	2230 - 2554	2230 - 2554	2230 - 2554	2554
Red copper, Phosphorus deoxidized copper	1940	1940 - 2220	2230	-
Aluminium	1940	1940 - 2220	1940 - 2220	-
Silver, Gold	2236 - 2554	-	2230 - 2554	-
Precious metal alloys	2236 - 2554	-	2236 - 2554	2236 - 2554

TYPICAL CHARACTERISTICS

Property	Unit	2020	1940	2220	2236	ask for more... 2230	2554
THERMAL CONDUCTIVITY	W/m°C	85	95	112	140	112	140
	Btu-Ft/Ft²Hr°F	49	55	65	81	65	81
Density	g/cm3	1,77	1,79	1,84	1,78	1,9	1,88
	lbs/ft³	110.5	112	114	111	118	117
Porosity	%	9	12	8	15	4	9
Hardness	Rockwell	95H	98L	80H	80L	85H	90H
	Shore	52	63	65	55	76	64
Modulus of elasticity (Young's Modulus)	GPa	10,7	9,2	11,4	9,8	11,4	11.2
	psi.106	1.6	1.3	1.6	1.4	1.6	1.6
Flexural strength	MPa	45	43	58	52	59	52
	psi	6,500	6,300	8,400	7,500	8,500	7,500
Compressive strength	MPa	98	89	124	105	129	120
	psi	14,300	13,000	18,000	15,200	18,750	17,400
Coefficient of Thermal Expansion (CTE)	x10-6 / C°	4,3	5,2	5,5	4,0	5,4	4,3
	x10-6 / F°	2.4	2.9	3.1	2.1	3.0	2.3
Electrical resistivity	µohm.cm	1 550	1 320	1 140	965	1 140	965
	ohm-in	0.00061	0.00052	0.00045	0.00038	0.00045	0.00038
Average grain size	µm	15	13	13	10	13	10
	inch	0.0006	0.0005	0.0005	0.0004	0.0005	0.0004
Max Standard block size	mm	1500x1500x300	530X435X1830	308x620x2030	308x620x915	152x620x915	308x545x915
	inch	60x60x12"	21.4x21.4x72	12x24x80	12x24x36	6x24x36	12x21.4x36
Ash	ppm	750	300	300	300	1 000	1 000



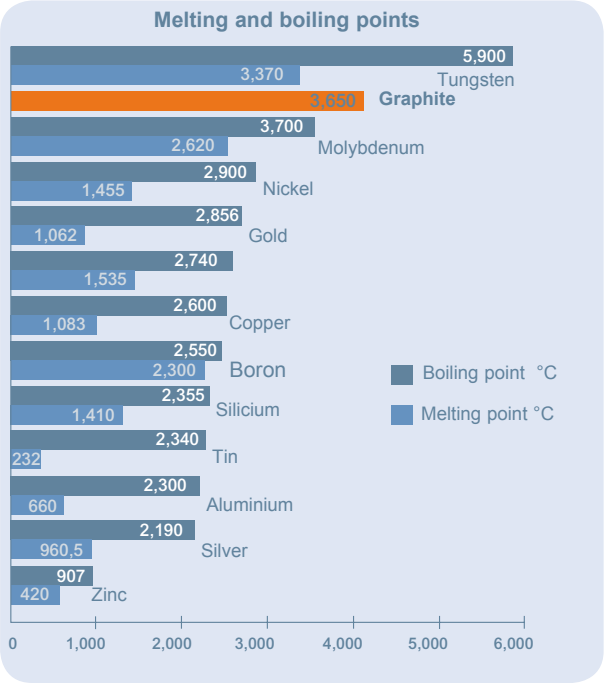


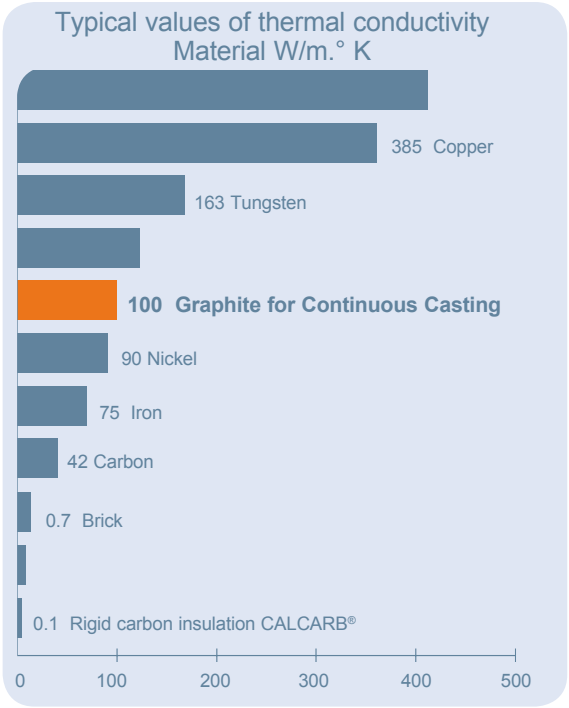
Our materials are in conformity with the RoHS-Directive (Restriction of the use of certain Hazardous Substances in electrical and electronic equipment).

Besides Mersen guarantees the application of the European Community REACH-Regulation (Registration, Evaluation, Authorisation and Restriction of Chemical substances) to all its plants located in Europe.

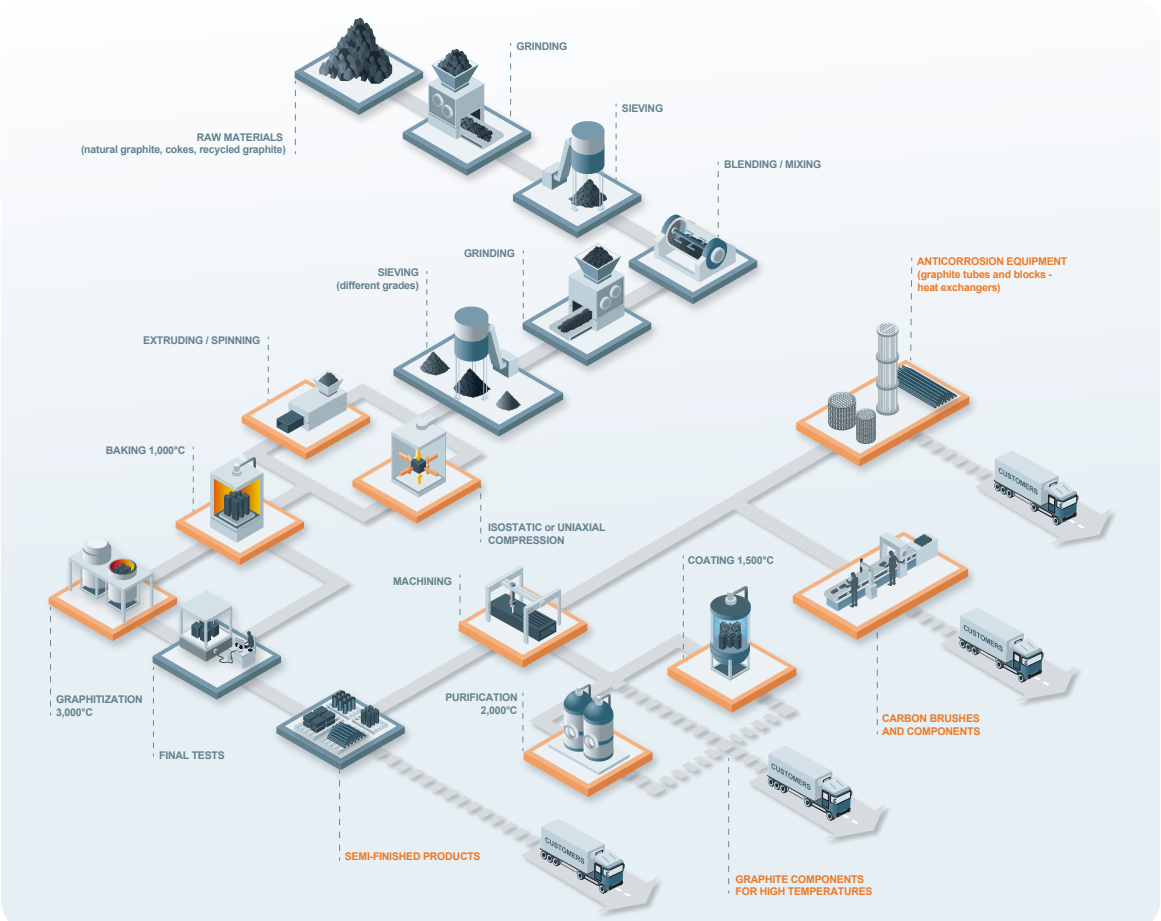
Graphite is well adapted for use as continuous casting dies because of its unique physical characteristics:

- Capable of withstanding molten metal temperatures. Graphite sublimates at 3,650°C and atmospheric pressure.
- High thermal conductivity.





Graphite manufacturing



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Expertise, our source of energy

A WORLD EXPERT
in materials and solutions for high temperature processes

A GLOBAL PLAYER

Global expert in materials and solutions for extreme environments as well as in the safety and reliability of electrical equipment Mersen designs innovative solutions to address its clients specific needs to enable them to optimize their manufacturing process in sectors such as energy, transportation, electronics, chemical, pharmaceutical and process industries.

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