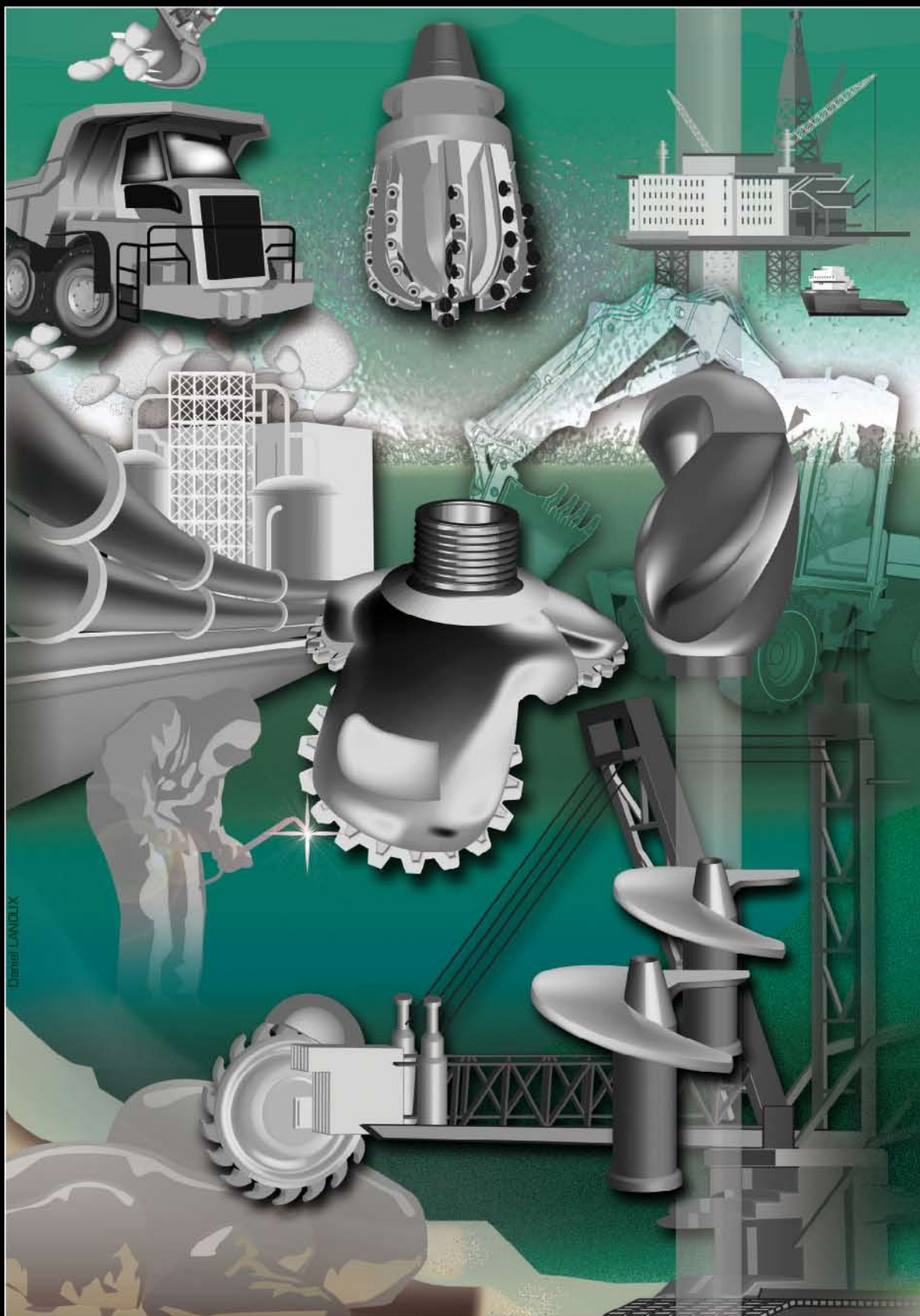


TECHNOGENIA



THE LEADER IN HARDFACING



Chemical CANALIX

TECHNOGENIA

High performances anti-wear protections

Technogenia has been founded in 1979 by Guy Maybon, engineer ECS.

Technogenia has specialised since its beginning in the production of high level anti-wear protections, based upon the production of Tungsten Carbide.

Since 1986 Technogenia is producing its own spherical cast Tungsten Carbide: The **Sphérotène®**, using an unique, innovative and patented process: the Cold Crucible.

Technogenia is worldwide represented.

Our most important fields of activities are:

Petrol drilling

Steel Industry

Dredging

Mining

Ceramic Industry

Aluminium plants

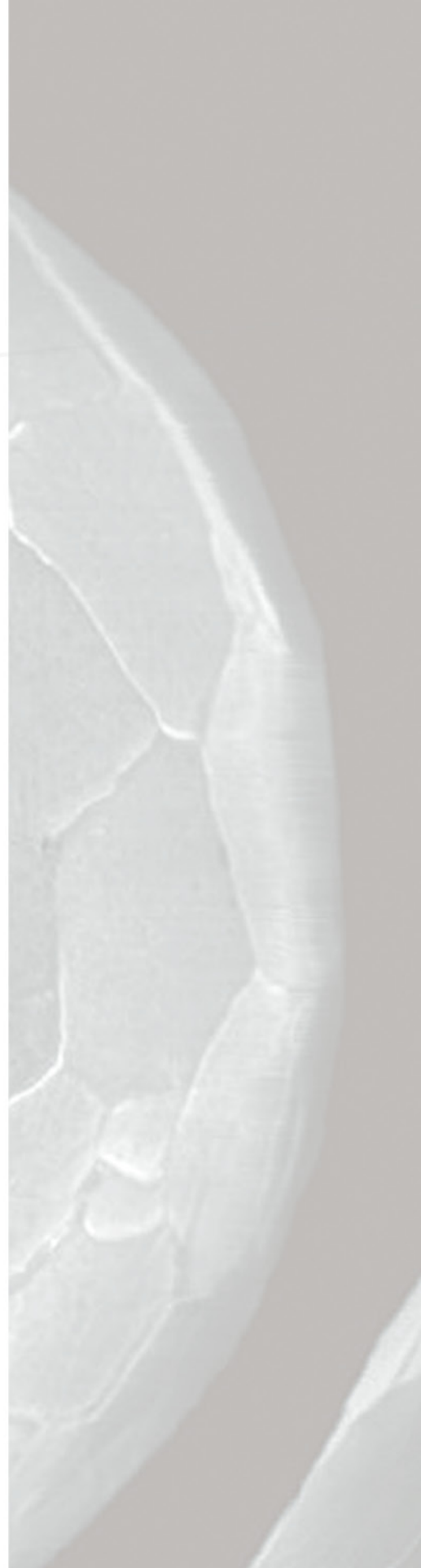
Foundries

Waste treatment and recycling

Cement Industry

Paper Industry

Tunnelling...



SPHÉROTÈNE®

Special spherical cast Tungsten Carbide.

Produced by Technogenia since 1986, using an unique, innovative and patented process, known as "the cold crucible". Sphérotène® are obtained by spraying a liquid phase of Tungsten Carbide.

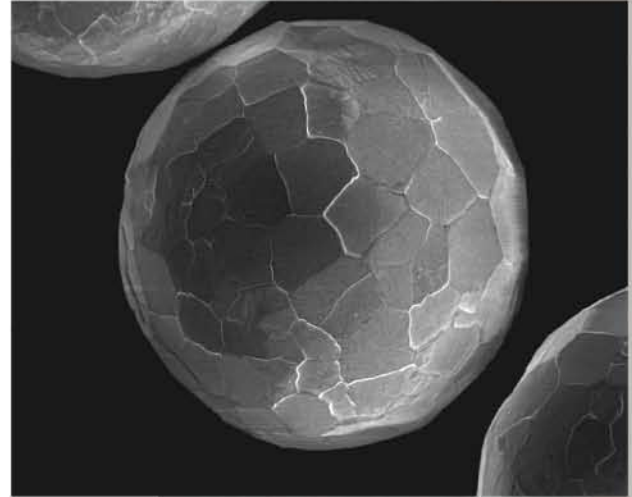


Sphérotène®'s main feature is its very fine metallurgical structure known as "tangled needles".

Sphérotène® comes as spheres with an extreme hardness of $3000 \text{ HV} \pm 500 \text{ HV}$.

Absence of oxydation of Sphérotène® makes the derived products highly weldable.

These particles give the deposits produced by Technogenia a much improved resistance to shocks, compared to deposits made up of crushed particles.

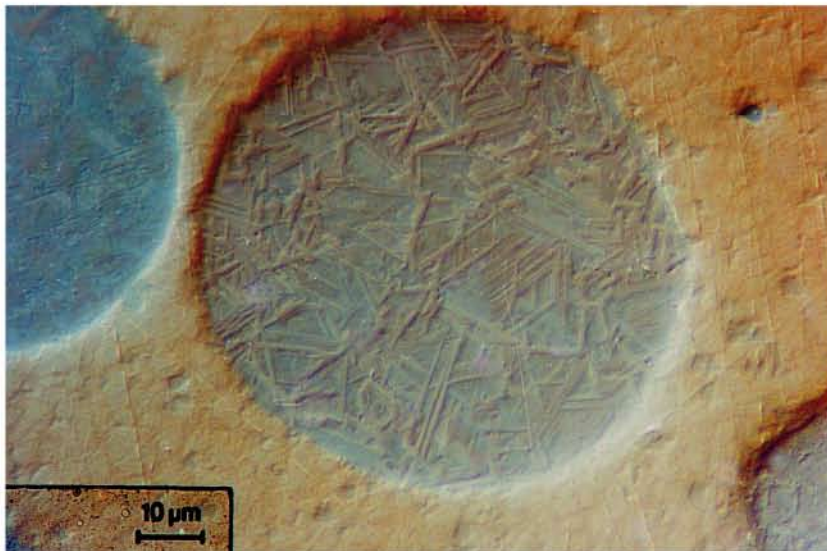


Hardness of Sphérotène®
 $3000 \text{ HV} \pm 500 \text{ HV}$
(HV = Hardness Vickers).



Spherical Cast Tungsten Carbide
size **40 to 2400 μm**
(microns)

Spherical Cast Tungsten Carbide 160 μm :
picture with **Knoop indentation** under 1 kg
(2.2lb.load.)



Sphérotène® are incorporated into the following hardfacing products offered by Technogenia:

The wire:

- **Technosphère®**

The powders:

- **Technopowders**
For oxyacetylene welding
- **Technopowders PTA**
For PTA technology
- **Technolase®** powders
For **Lasercarb®** process

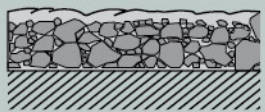
Special protections with

- **Technocasting®**

TECHNODUR® & TECHNOSPHERE®

Technodur® and **Technosphere®** are made up of a nickel core wire, coated with a thick layer of Tungsten Carbide and Ni Cr B Si alloy.

2 to 10 mm



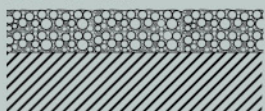
Technodur®:

Crushed Tungsten Carbide grains
Hardness 2000 HV ± 200 HV

Since the beginning **Technodur®** has represented a very significant advance in the field of anti-wear protections.

They give new possibilities and advantages: no smokes, no loss during welding, exceptional resistance to abrasion, ease of repairs, no cracks.

2 to 10 mm



Technosphere®:

Spherical cast Tungsten Carbide grains
Hardness 3000 HV ± 500 HV

The difference lies in the use of spherical Tungsten Carbide grains called "**Sphérotène®**."

The spherical shape and the extreme hardness of the **Sphérotène®** give

Technosphere®, amongst other properties, two advantages:

Better shocks resistance

Unequaled wear resistance.

PRODUCT		THICKNESS OF THE DEPOSIT	MAIN GRAIN SIZE	BEAD DIAMETER
TECHNODUR	SGF	2 to 4 mm	0,13 to 0,2 mm	4 - 6 and 8 mm
TECHNODUR	GF	2 to 5 mm	0,2 to 0,4 mm	4 - 6 and 8 mm
TECHNODUR	GN	3 to 6 mm	0,4 to 0,7 mm	4 - 6 and 8 mm
TECHNODUR	GG	3 to 8 mm	0,7 to 1,2 mm	6 and 8 mm
TECHNODUR	TGG	4 to 10 mm	1,2 to 2,2 mm	6 and 8 mm
TECHNOSPHERE	GF	2 to 5 mm	0,2 to 0,4 mm	4 - 6 and 8 mm
TECHNOSPHERE	GN	3 to 6 mm	0,4 to 0,7 mm	4 - 6 and 8 mm
TECHNOSPHERE	GG	3 to 8 mm	0,7 to 1,2 mm	6 and 8 mm
TECHNOSPHERE	TGG	4 to 10 mm	1,2 to 2,2 mm	6 and 8 mm





Application and packaging:

Technodur[®] and **Technosphère**[®] are available in 20 kg reels (also possible in 10 or 15 kg upon request) allowing an economic and reliable weld.

These materials are applied with the Technokit T2000, an oxyacetylene torch.

Welding is easy and economic. It offers the major advantage of preserving the hardness of the Tungsten Carbide particles.

Use:

Technodur[®] and **Technosphère**[®] can be applied to all non-martensitic steels and weldable stainless steels. The deposits are free from cracks and any deformation caused by welding is very limited.

Technodur[®] and **Technosphère**[®] can be welded easily onto themselves. This is a real advantage for some repairs.

Main applications:

Petrol and drilling

- Stabilizer blades
- Drilling heads

Foundries and steel industry

- Blades and scrapers for sand mixers
- Press guides

Ceramic Industry

- Press screws
- Blades and screws for mixers
- Scrapers for cylinder
- Sheaths and casings for press

Aluminium Plants

- Screw elements

Dredging

- Cutter teeth

Waste treatment and recycling

- Conveyor screws

Food Industry

Paper Industry

Cement works



TECHNOPOWDERS

The solution to a wide range of hardfacing problems
The Technopowders products cover range of hardness from 40Rc to 60Rc and even greater with Tungsten Carbide powders.

Other types can be supplied upon request.

Sphérotène® is a very high hardness spherical cast Tungsten Carbide.

The Technopowders have the FDA agreement and can be used in the food industry.

NICKEL-BASED HARDFACING POWDERS

Supplied in 1 and 5 kg pots

- **Technopowder MB 40 / TP 40 RC Underlayer Powder**
Hardness: 40 Rc
Main application: oxidation inhibiting underlayer for Technodur® and Technosphère®
- **Technopowder 60 RC / TP 60 RC**
Hardness: 60 Rc
Base composition: Ni Cr B Si: (12 to 16% Chromium)
Main application: finishing or sliding coat for barrel extruder and screw conveyor faces

Application: oxyacetylene torch, Type TECHNOKIT T 2000.

PREMIXED CARBIDE POWDERS

Supplied in 1 kg pots

- **Technopowder 2030**
Nickel base + crushed cast Tungsten Carbide
2000 HV ± 200 HV
Applications: thin hardfacing
Machining: not possible
Grinding: possible
- **Technopowder 40/40**
Nickel base + crushed cast Tungsten Carbide
2000 HV ± 200 HV
Applications: hardfacing, medium thicknesses, causes very few deformations.
Crack-free hardfacing
Recommended for stainless steels.
Machining: not possible
Grinding: possible / depending on the shape
- **Technopowder 4000**
Nickel base + Sphérotène® 3000 HV ± 500 HV
Very high hardness spherical cast Tungsten Carbide
Applications: very high performance hardfacing, low thicknesses
Machining: not possible
Grinding: possible / depending on the shape
- **Technopowder 4040 S**
Nickel base + Sphérotène® 3000 HV ± 500 HV
Very high hardness spherical cast Tungsten Carbide
Applications: very high performance hardfacing, medium thicknesses on base materials susceptible to deformation, e.g. stainless steels.
Crack-free hardfacing.
Machining: not possible
Grinding: possible / depending on the shape

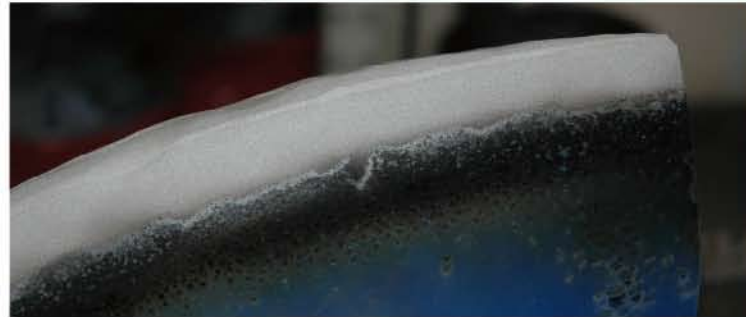
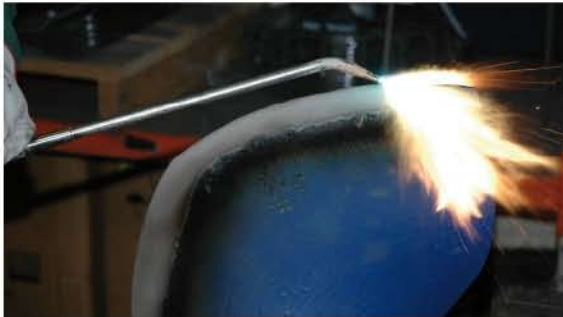
Application: oxyacetylene torch, Type TECHNOKIT T 2000.

Technolase® POWDERS FOR LASER CLADDING

Supplied in 1 kg pots

- **Technolase® 30 S**
Nickel Base + Sphérotène® very high hardness spherical cast Tungsten Carbide.
Special powder for Laser cladding
Applications: drillings tools, screens, protective plates...
Machining: not possible
Grinding: possible / depending on the shape
Thickness: 0.5 to 3 mm (up to 5 mm possible)
- **Technolase® 40 S**
Nickel Base + Sphérotène® very high hardness spherical cast Tungsten Carbide.
Special powder for Laser cladding
Applications: all types of parts, including weldable cast iron, stainless steels and non-magnetic steels.
Machining: not possible
Grinding: possible / depending on the shape
Thickness: 0.5 to 6 mm (up to 8 mm possible)

Application: heavy duty Laser / Technogenia's **Lasercarb®** process.



Technopowders

Cat.	Item	Crushed Carbide Hardness	Sphérotène® Carbide Hardness	Carbide size	Carbide Concentration	Base Alloy	Alloy Hardness	Melting point	Deposit density	Recom. Deposit Thickness
Powder NiCr	MB40	no	no			NiCr	40 HRc	1087 °C	8,2	0,5 mm
Powder NiCr	TP 40 RC	no	no			NiCr	40 HRc	1087 °C	8,2	0,5 to 3 mm
Powder NiCr	TP 60 RC	no	no			NiCr	60 HRc	1038 °C	7,8	1 to 2 mm
Powder WC	TP 2 030	2000 ± 200 HV	no	40-100 µ	40 % by weight	NiCr	60 HRc	1038 °C	10,5	1 to 2 mm
Powder WC	TP 40/40	2000 ± 200 HV	no	40-100 µ	40 % by weight	NiCr	40 HRc	1087 °C	11,2	1 to 2 mm
Powder WC Sphérotène®	TP 4 000		3000 ± 500 HV	40-100 µ	40 % by weight	NiCr	60 HRc	1038 °C	10,5	1 to 2 mm
Powder WC Sphérotène®	TP 4040S		3000 ± 500 HV	40-100 µ	40 % by weight	NiCr	40 HRc	1087 °C	11,2	1 to 2 mm
Powder Lasercarb®	T.LASE 30s		3000 ± 500 HV	40-210 µ	> 60 % by weight	NiCr	30 HRc	1070 °C	13	0,5 to 3 mm
Powder Lasercarb®	T.LASE 40S		3000 ± 500 HV	40-210 µ	> 60 % by weight	NiCr	40 HRc	1070 °C	13	0,5 to 6 mm

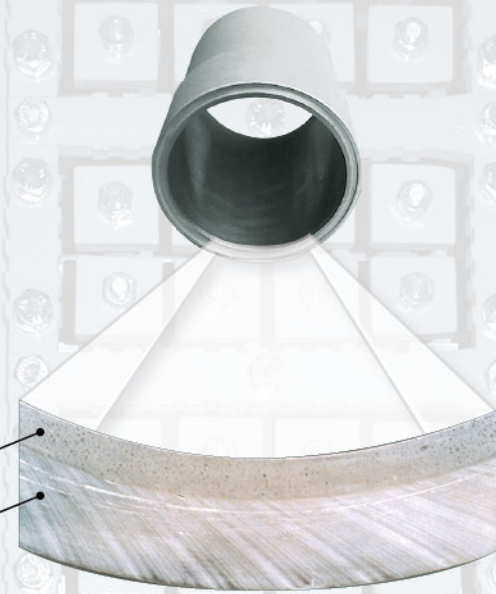
TECHNOCASTING®

Technocasting® process is used for the production of Tungsten Carbide protection impossible to create by the usual techniques of gas welding.

Technocasting® enables to run over the limitations of traditional welding. By using the **Technocasting®** process it's possible to make grooves and internal tubes claddings.

Technocasting® Coating

Steel part



TECHNOCASTING® PROCESS:

Using this foundry-like technology, an infiltration of a brazing alloy with a compact assembly of **Sphérotène®** is performed in a mould.

Principle:

The coating is composed of a very dense combination of **Sphérotène®** and a brazing alloy. During the process, the brazing alloy melts and infiltrates the **Sphérotène®** by capillary action.

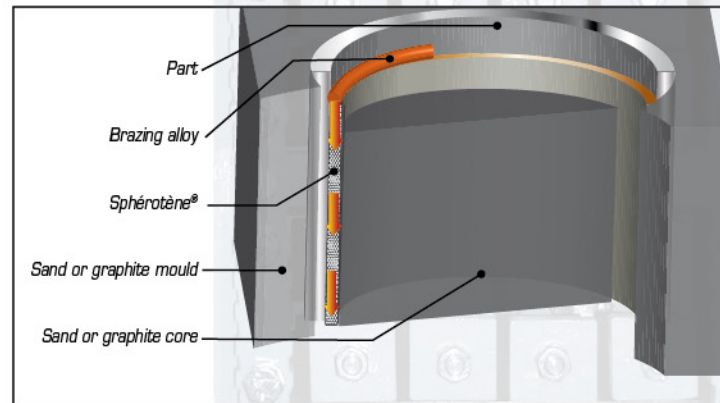
Characteristics:

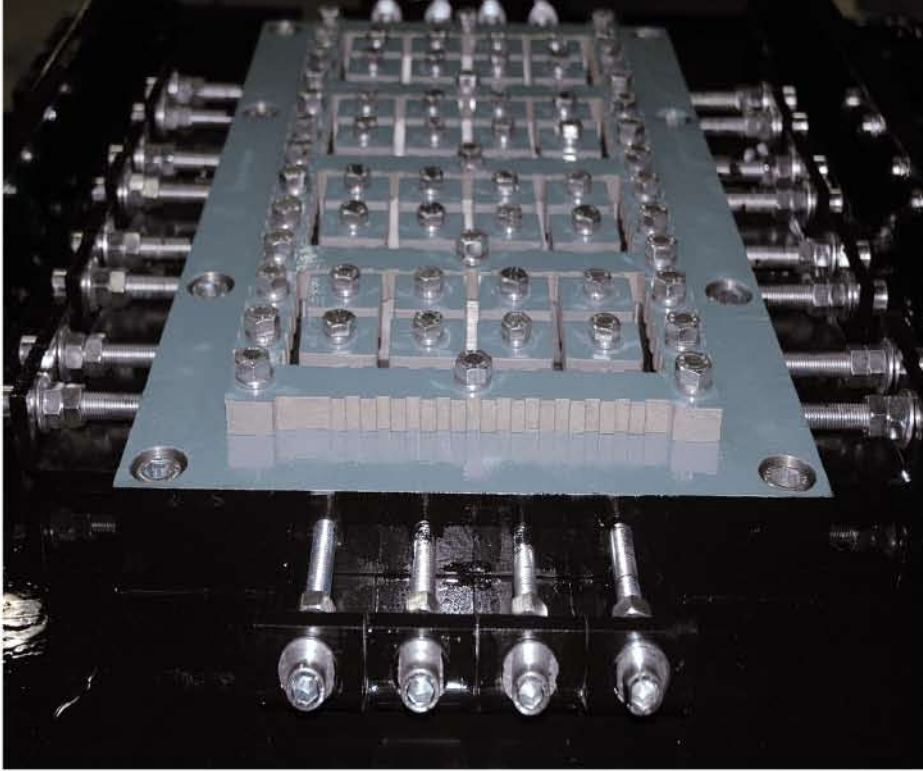
- Thickness of the deposit: from 2 to 10 mm (5 mm is the optimum)
- Composition: mini 70 % of **Sphérotène®** + brazing alloy.
- Carbide hardness: 3000 HV \pm 500 HV
- General tolerance: \pm 0,2 mm
- Original roughness: Ra 6.7
- After grinding: Ra 0.4
- Maximum Height: 550 mm (please enquire if more is required e.g. sub-assemblies can be made).
- Bore from 10 to 550 mm

Conclusions:

Technocasting®

- Allows complex shapes and internal coatings
- Well adapted for small series
- Guarantees maximum homogeneity and density thanks to **Sphérotène®**
- Gives a very regular surface
- Provides excellent impact resistance
- Can be grinded





Some examples of applications

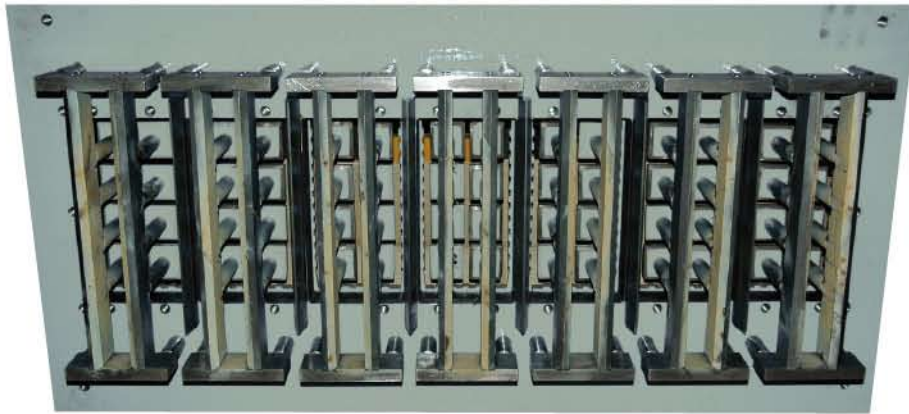
Foundries:

- Mould drills
- Feed heads of complex shapes
- Scrapers / sharp angles



Ceramic industry:

- Cores and rakes for dies (brick making)
- Dies for tiles



Cement Works:

- Conveyors and feeder screws

Miscellaneous:

- Casings
- Presses



Petrol:

- Radial bearings
- Pump sleeves
- Wear sleeves



LASERCARB®

by TECHNOGENIA.

Principle:

The process consists in using the energy of a Laser beam to melt the deposition powder (NiCr or other material) on the part. This process leads to a real metallurgical bonding between the deposit and the base metal.

Benefits:

Uses powders based on **Sphérotène®** spherical cast Tungsten Carbide
Very high hardness: 3000 HV ± 500 HV
Sphérotène® are not affected by the **Lasercarb®** process.
Absence of porosity
Extremely limited cracking and deformation
Large deposit thickness: 0.5 to 3 mm (For more contact us)
Perfect adherence through welding
Precision
Automation
Reproducibility

Specifications:

- **External deposit**
Capacity and weight given for the Saint-Jorioz site: X = 3000 mm,
Y = 1000 mm, Z = 400 mm,
Weight: 3000 kg
- **Internal deposit**
Saint-Jorioz site
Minimum diameter 150 mm for
1000 mm length. (For more contact us).
- **Thickness deposit**
0.5 to 3 mm. (For more contact us).
- **Grinding: possible**
Due to their extreme hardness, **Lasercarb®** deposits cannot be machined except by grinding with diamond tools.

Lasercarb® Coatings:

The **Lasercarb®** process implements **Technolase** powders based on **Sphérotène®**: spherical cast Tungsten Carbide by Technogenia

Other types of coatings:

- Cobalt based powders: **Stellite®**
- Nickel based powders: **Inconel®**
- Steel based powders: Stainless

Recommended Base Materials:

- All weldable steels
- Most stainless steels
- Non magnetic steels particularly those used for drilling equipments
- Titanium
- Some types of (weldable) cast irons,
- Tool steels.

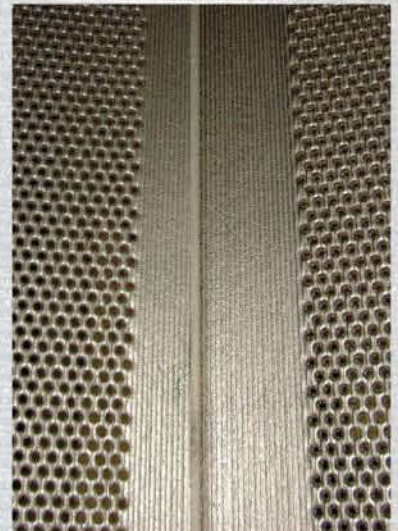
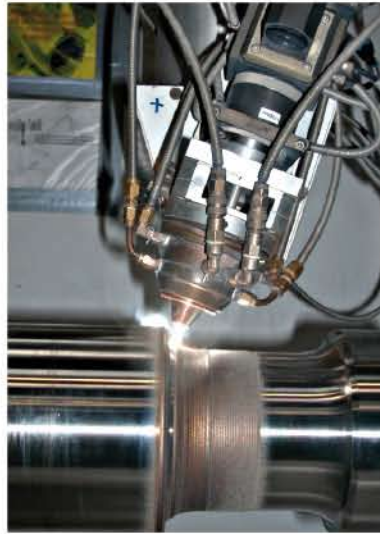
Main Applications:

- Oil drillings tools
- Wear parts in the agri-food industry
- Paper industry
- Ceramic industry
- Foundries
- Tunnel boring
- Pump rings and shafts
- Cylinders and rollers in the steel industry

Lasercarb® applications



LASERCARB[®]



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