

4] Deposition of Technodur and Technosphère rope

■ General rules

This deposition is always done in a flat position.

- On a new part, the powder must melt before the rope is deposited (fig. 1, 2, 3 et 4),
- On a part already coated with Technodur or Technosphère, the matrix of the previous deposit must melt. The base metal temperature is 350°C/450°C (662°F/842°F) (fig. 1, 2, 3 et 4).

■ Equipment

Technokit 2000 torch with rope applicator to be chosen according to the dimensions of the part and the thickness of the deposit to be applied (fig. 5).

- For a part that is greater than 10 mm thick, use rope applicator No. 5.
- For a part that is less than 10 mm thick, use rope applicator No. 4.

Use the spool holder in order to be able to unwind the rope. Place the Technosphère in the rope sleeve appropriate for its diameter and have it protrude by about 10 cm (4 in).

STEP 4

- First turn on the acetylene and only after that the oxygen,
- Neutral flame,
- Recommended pressures (Technokit 2000) :
C₂H₂ (acetylene) 0.8 to 1 bar (11 PSIG)
O₂ (oxygen) 4 to 5 bars (50 PSIG)
- Local temperature of the part: 400°C (752°F),
- The matrix of the rope melts at about 1050°C (1922°F).



STEP 5

- Bring the flame close to the part to remelt Technopowder MB40. When the powder melts, a glassy puddle will appear. Bring the rope near and angle the flame towards the rope in order to melt the matrix.
- The molten rope flows onto the part. Point the flame at the part again, giving it a continuous rotational movement to spread the heat uniformly. Adjust the angle of the flame according to the mass of the part being hardfaced so that the part can be heated at the same time as the rope. Always start by welding the edges of the area to be protected, if it has any.
- In order to protect a surface, proceed in stages: mark out the area to be protected with rope. Next, space each rope about 20 mm (1 in) from the previous one. Fill in the space by welding, then repeat.
- The rope must "wet" correctly and not form any "drops." In this case, there would only be a cold lap.
- If the temperature is not adequate, if the part is oxidized, or if the part is inadequately prepared, the rope will "roll" in the form of drops on the surface of the part.
- Do not attempt to hardface the entire part in a single operation. Organize your work in several stages (fig. 1 et 2). Apply the first rope to the edges and then to the surface being hard-faced (see photos opposite) (fig. 3). For a thin edge, use a 4-mm rope. For a large surface with a substantial thickness, use an 8-mm rope (fig. 4).
- If you need to grind the hardfacing: grind hot before cooling.
- Turn off the torch: first turn off the acetylene and only then the oxygen.
- Large-diameter rope: 6 and 8 mm allow for thicker deposits.

END



1] Equipment

Technokit case: TECHNO 2000

■ TECHNOGENIA torch Kit in complet set

At the heart of the application is the torch specially designed by Technogénia to deposit the product in the least amount of time, so that its superior wear properties are not compromised. The kit consists of a torch with several size tips and a powder attachment to deposit the pre-weld powder to prevent base metal oxidation. All Technogénia ropes and powders can be welded using this torch. In addition, the torch is well balanced for ease of use and easy maintenance (fig. 1 et 2).

■ Protective Gear (fig. 3)

- **Welding gloves:** relatively thick protective gloves made of leather or cotton are recommended.
- **Lenses:** A shade made especially for oxy-acetylene, shade 5-6 works well. For grinding, a clear shield is recommended.
- **Fume control:** Unlike many traditional welding procedures, the application of Technosphere and Technodur produces no smoke or harmful fumes. While grinding, a dust mask is suggested.
- **Noise Suppression:** The noise produced is relatively low, but in combination with the shop background, it is recommended that hearing protection be used especially while grinding.

■ Acetylene and oxygen tanks

Because of the rapid draw of acetylene a manifold of at least 2 tanks is preferred. The manifold allows the acetylene to be drawn from the tanks without the risk of drawing acetone along with the gas, which causes the flame temperature to decrease and welding to become difficult. It also helps in drawing all the acetylene from the tank. A single bottle of oxygen works well.

■ Positioner and/or clamps

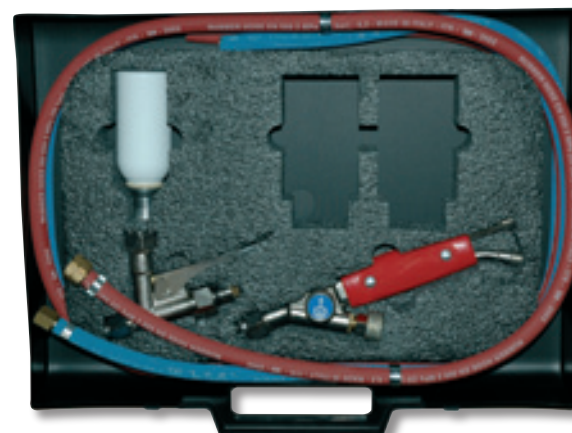
These make it possible to secure and manipulate the part. The welding operations are done with the part in a flat position. A positioner is indispensable for hardsurfacing work on the blades of a brick plant, for example.

■ Grinder

Clean area to be surfaced to bright metal.



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WELDING PROCEDURE

2] Preparation of the part

Caution – this step is very important and must not be skipped under any circumstances.

Cleaning the area to be welded to a bright metal condition and maintaining it in that condition during welding is most important.

STEP 1

Securely attach the part to an adequate support (fig. 1).

STEP 2

Grinding or sand-blasting of the part: to remove any traces of oxidation on the area to be hard-faced (fig. 2 et 3).

STEP 3

“Break” any edges, if necessary, to avoid any corner effect and oxidization beneath the deposit, if protection of the edges is called for (fig. 4).

■ Tips and tricks

The sparks produced during the grinding operation can indicate the weldability of the base steel.

- **Short red sparks:** The base material is an alloy of high alloy steel, is difficult to weld, and should be avoided.
- Stainless steels and non-magnetic ferrous alloys must undergo special procedures in order to be hardsurfaced with a flame.
- **Long yellow sparks:** low alloy steel: weldable.

Caution: Do not allow more than 6 hours to elapse between grinding and hard-facing. If the part becomes oxidized during the hard-facing process, do not hesitate to grind it again!

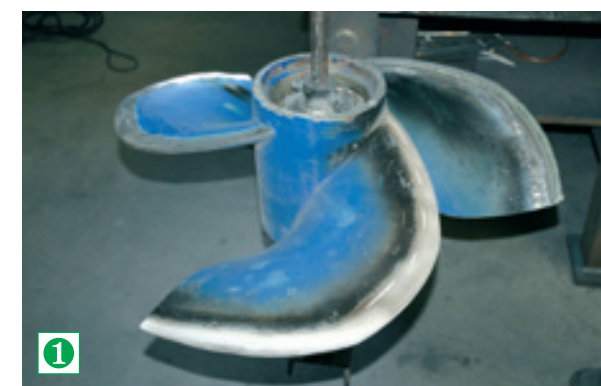
Hard-facing is done solely with a mixture of acetylene and oxygen!

Acetylene is a fuel. It involves a risk of explosion in the event of leakage into the surrounding air or if air or oxygen should enter the line through which it is flowing.

- **Forbid** the use of copper lines because acetylene reacts with copper and silver.
- **Make sure** a check valve is installed; use an aerosol to locate any leaks.
- **Use** the minimum flow rate indicated on the tank to avoid any outflow of solvent (acetone) contained in the tank.

Oxygen is an oxidizer (it causes combustion). Never grease a seal or any part of the circuit's equipment.

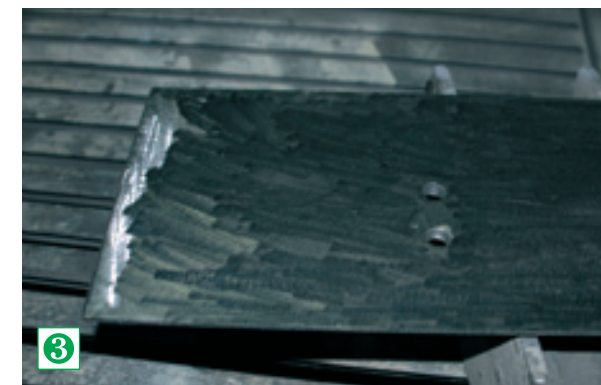
- **Close** the valves on the tanks when done using!
- **Handle** the tanks and pressure regulators with care and keep away from temperatures greater than 50°C.
- **Only use** equipment that is in good condition.



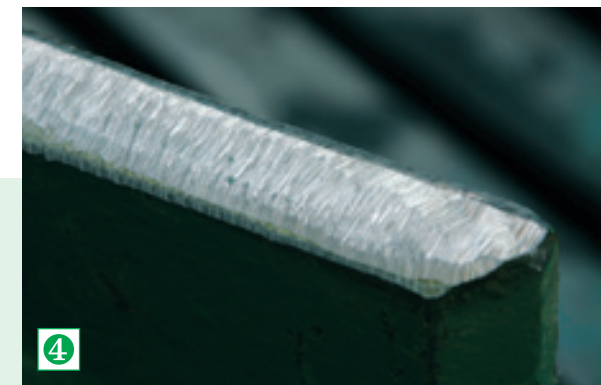
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3] Powdering of the part

The first time hardsurfacing application of a new part, powdering is indispensable.

Powdering is done in a flat position on the surface to be hard-faced after preheating the area to 150°C (302°F).

■ Tips and tricks

As the base metal starts to turn straw-colored, the powdering can begin. Otherwise check the temperature with an appropriate thermometer (fig. 2).

■ Equipment

The Technokit 2000 torch with powder spray gun to be chosen according to the dimensions of the part (fig. 5).

Technogénia MB 40 powder.

Powdering temperature: 150°C (302°F).

A light dusting of powder covering the entire area to be protected is sufficient.

The powder must not blacken (fig. 2).

- **Working distance:** about 10 cm (4in) between the end of the spray gun and the area to be hard-faced (fig. 3).
- **Neutral or slightly reducing flame.**
- **Recommended pressures (Technokit 2000) (fig. 4) :**
C₂H₂ (acetylene) 1 bar/11 Psig
O₂ (oxygen) 5 to 6 bars/50 Psig

■ Tips and tricks

Powdering is not necessary when Technodur or Technosphere is still present on the part. Good sand-blasting or grinding is sufficient. The part must be “clean”.

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