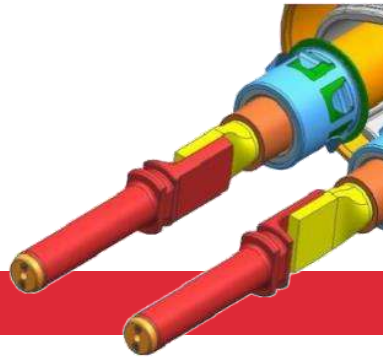
PATENT PENDING

PRESENTATION OF THE COMBRAZING PROCESS

N° FR1910231



Update : Sept. 2019

TECHNAX
Quality Welding Solutions

INTRODUCTION

The topic of the **combrazing** process is the fabrication of an electrical connection.

It consists of the combination of two different operations :

1. the compacting of a cable.
2. The hard brazing of this cable on a connecting element (for instance terminal /busbar /pin).

Through the **Combrazing** process, one electrical connection is achieved in **<u>one single operation</u>** vs 4 traditionally*

* considering the compacting + the cutting of the cable + the pre-brazing of the terminal + the brazing of the cable

DESCRIPTION OF THE PROCESS

In the common assembling method, following operations are required :

- ❑ compacting of a cable. ①
- ❑ Pre-brazing of the terminal (for instance by resistance or laser) or by mechanical stamping of the brazing strip into the terminal. ②
- ❑ Recut of the cable. ③
- ❑ Brazing of the cable onto the terminal. ④

① ② ④ **Through the combrazing process, cable and pin are loaded at the same time** into a jig. Once the cycle start is released, the cable is compacted and brazed onto the pin with an automatic feeding of brazing material (foil) between the cable and the pin.

③ **Through the combrazing process, no cable recut is necessary.**
With the common assembling method, the compacting of the cable requires an over-length of it in order to get the same compacted quality on the desired length. If the compacting is done until the cable end, it may overheat as there is no dissipation way of the energy. To avoid the overheating of the cable end, it is compacted and its extremity which has not been compacted is cut (so-called overlength) ➔ material waste.

BENEFITS OF ONE SINGLE OPERATION

One single operation, i.e. equipment means :

✓ **Faster output rate :**
- single parts are manipulated only once.
- compacting and brazing operations take place simultaneously in one working step.
- no pre-brazing of the terminal.

✓ **Reduced space area** needed for the equipment.

✓ **Lower investment costs.**

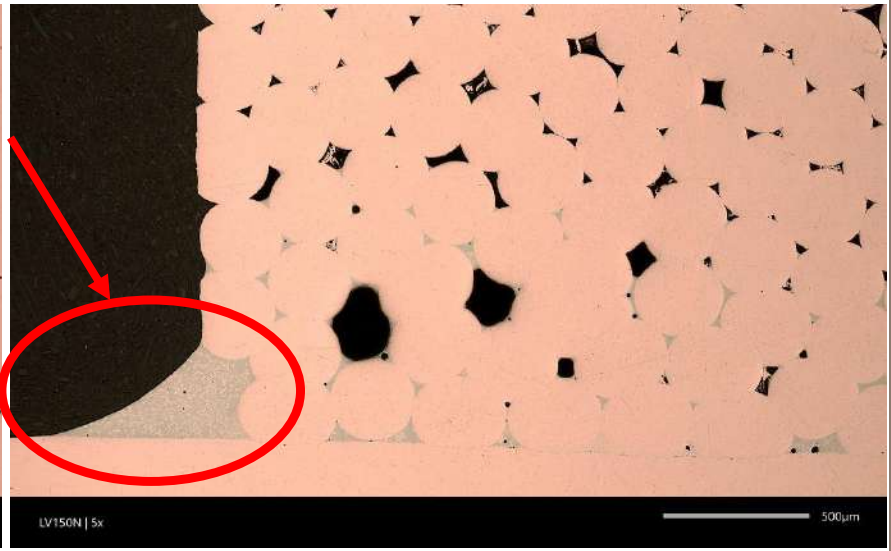
✓ **Diminution of running costs** :
- Lower electrodes consumption as only one electrodes set is required instead of one for compacting and one for brazing.
- Lower energy consumption
  ➔ planet-friendly
- Human resources reduction

QUALITY BENEFITS OF THE COMBRAZING PROCESS

The **combrazing** process increases your **product quality**.

- First of all, the obtained compacted area of the cable is very strong, ensuring a perfect mechanical strength with the terminal. This is achieved through the **better penetration of the brazing material** inside the cable strands.

- Secondly, through the **Combrazing** process, the brazing alloy remains inside the joining area. Therefore, the brazing flow is better controlled. It enables for example the brazing on a terminal which has the same width than the compacted cable.



TECHNAX
Quality Welding Solutions

QUALITY BENEFITS OF THE COMBRAZING PROCESS

- In the traditional method, the energy needed for the compacting should be high enough to avoid a deformation during the brazing process. The main difficulty is to find out a good **compromise** between a high density of the strands during the compacting step and a high electrical resistance of the strands (achieved through low density) in order to facilitate the brazing operation.

In the worst case,

- strands of the cable may spread out offering a poor joining quality or potential short-circuits

or

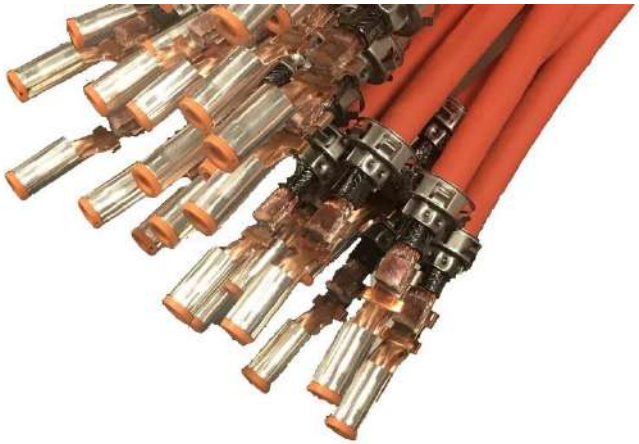
- Higher energy (i.e. reduced electrodes life-time) is needed to get a very good compacting.

- Through the common method, depending on the quality of the compacting, the next step (resistance brazing) is directly impacted.

- Through the **Combrazing** process, only **one set of parameters is needed**.

Combrazing process is globally more reliable and repeatable

EXAMPLES OF COMBRAZING PROCESS



EXAMPLES APPLICATIONS FOR E-MOBILITY

PULL TEST ON A BRAZED CABLE

TECHNAX
Quality Welding Solutions

technax@technax.com

www.technax.com

220 rue Ferdinand Perrier
69800 Saint-Priest / France

☎ : +33 (0)4 78 90 01 61
🖷 : +33 (0)4 78 90 85 79

Update : Sept. 2019

TECHNAX
Quality Welding Solutions