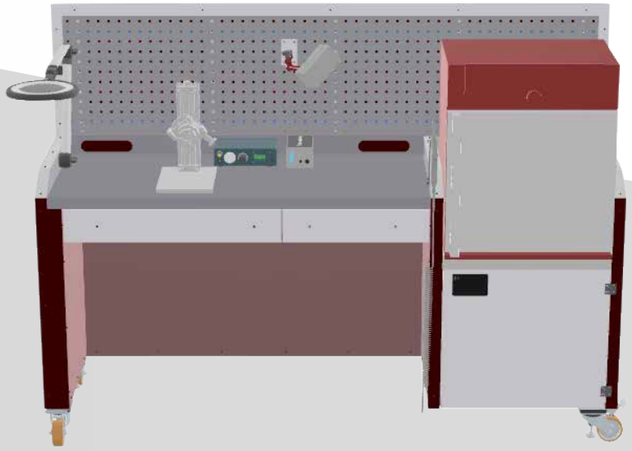
Cleaning table

Including ultrasonic bath

Assembly table

Including:
- Refrigerator
- Dispensing system
- Vacuum tweezers
- Pressurized air gun
- Illuminated magnifier
- Drying oven



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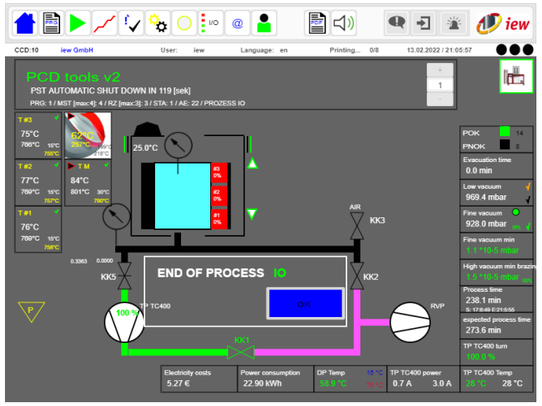
AUTOMATED VACUUM BRAZING SYSTEM VVBM 150

The automated vacuum brazing system VVBM 150 (Vertical Vacuum Brazing Machine)

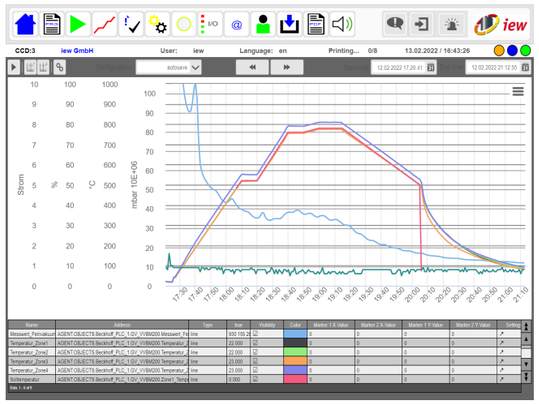
24/7 ready to use: For brazing of carbide, ceramic- and diamond tools, the VVBM 150 consists of a vertical vacuum chamber with a Pfeiffer Vacuum turbo pump incl. IEW PLC control for precise temperature control, ready for industry 4.0.

The unit can be used for reliable brazing of batches, is easy to operate and the process itself is controlled via a 2-zone temperature control with the IEW PLC.

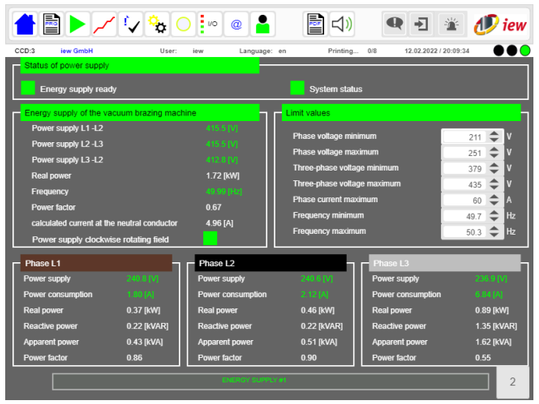
To keep contamination of the system and the components as low as possible, we decided to use a quartz glass tube as the vacuum chamber in order to be as metal-free as possible. This enables us to further optimize the component quality of the vacuum-brazed products.



Process interface



Temperature curve



Power supply interface

Vacuum brazing system VVBM 150

Technical data VVBM 150

Work area:	up to D 134 mm x L 240 m
Max. Vacuum:	10^{-6} mbar
Max. temperature:	approx. 900 °C
Dimensions:	1281 x 850 x 1530 mm
Weight:	650kg
Mains supply:	3 x 400V/N + PE 35A 50Hz
Power consumption:	
Heating power:	
Compressed air connections:	3-6 bar
Vacuum chamber:	D 138 mm x L 340 mm
Cooling:	Cooling water
Preparation time:	ready to braze within 5 minutes

Brazing is a thermal process for joining equal and composite base materials. In this regard, the vacuum brazing process is the ideal brazing method for high-strength joints for hard-to wet materials such as tungsten carbide, ceramic or diamond materials e.g. solid PCD, MCD, CVD, etc. Since no flammable gas or flux is used, it is a very clean and environmentally friendly process, the power consumption can be easily viewed on the display of the machine.

Of course, the vacuum brazing process itself is a greater challenge than, for example, brazing with a gas flame. The process including the selection of the applied brazing filler metal must be selected individually for each material and carried out with different brazing parameters (ramp, holding time, cooling ramp, etc.)

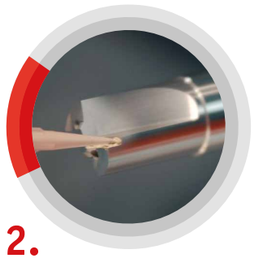
By a vertical arrangement of the quartz glass as the vacuum chamber, IEW has created the opportunity to use multiple levels of fixtures to equip with tools or place long components standing inside the quartz glass. For optimal temperature distribution we have constructed a 2-zone vacuum chamber which can be controlled independently from one another to realize very homogenous temperatures with <10 °C within the chamber.

The thermal distortion of the components to be brazed can be minimized as far as possible by means of the specifically adjustable temperature ramps, nevertheless, depending on the size of the component, it is urgently necessary to ensure an ideal temperature control. Once the optimum setting has been found for a group of components, the vacuum brazing process can be reproduced absolutely reliable.

Different products can be processed in one brazing cycle, it should be taken care of though, that the parts are about equal size or it might lead to insufficient brazing results. Workshop drawings of the products can be assigned to the corresponding program and be stored on the unit. With that, fitting product groups can be created and brazed simultaneously.

Brazing in 6 steps

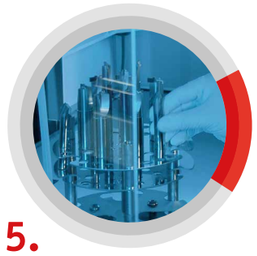
1.
Cleaning of parts
e.g. with ultrasonic bath



2.
Apply brazing paste or foil

3.
Place cutting edge(s)

4.
Drying in predrying oven



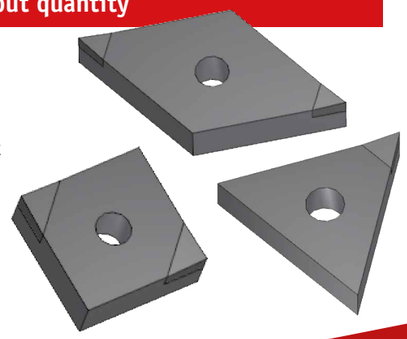
5.
Shortest process time
approx. 90 minutes
Normal process time
approx. 3 hours

6.
Take and control brazed parts

approx. output quantity

Inserts:

350 parts/cycle
1400 parts/shift
4200 parts/day



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VVBM 150