

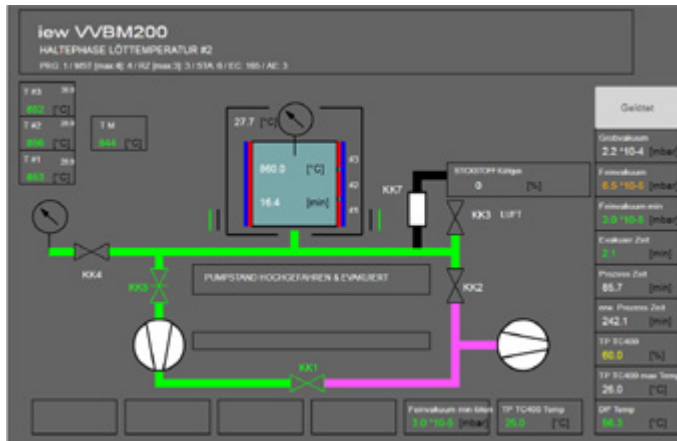


**VACUUM BRAZING SYSTEM  
VVBM 200**

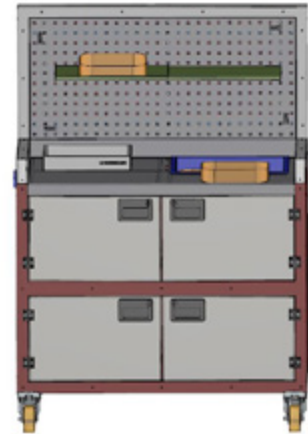
# The automated vacuum brazing system VVBM 200 (Vertical Vacuum Brazing Machine)

24/7 ready to use: For brazing of carbide, ceramic- and diamond tools, the VVBM 200 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.

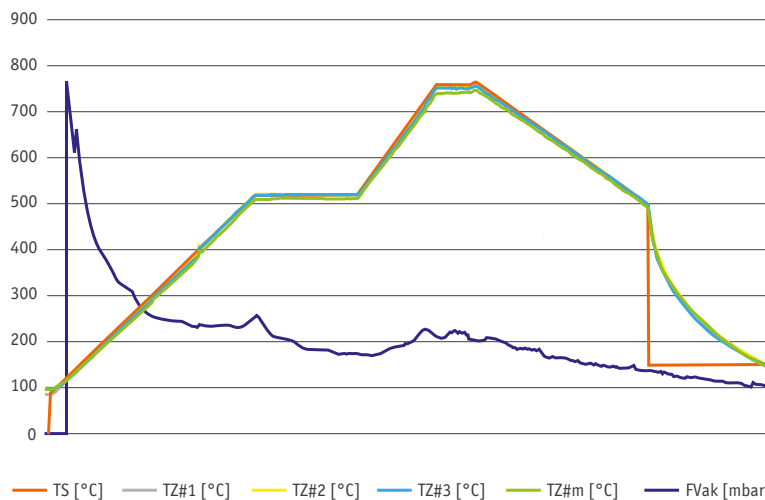
The unit can be used for reliable brazing of batches, is easy to operate and the process itself is controlled via a 3-zone temperature control with the IEW PLC.



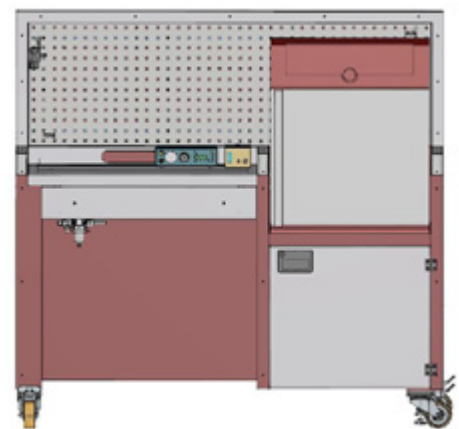
Process interface



Cleaning table



Temperature profile



Assembly table



Vacuum brazing system VVBM 200

## Technical data VVBM 200

Work area:	up to D 180 mm x L 300 mm
Max. vacuum quality:	10 <sup>-6</sup> mbar
Max. temperature:	approx. 900 °C
Dimensions:	1800 x 800 x 1850 mm
Weight:	650kg
Mains supply:	3 x 400V/N + PE 35A 50Hz
Power consumption:	max. 28kW
Heating power:	24kW
Compressed air connections:	3-6 bar
Vacuum chamber:	D 188 mm x L 550 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.

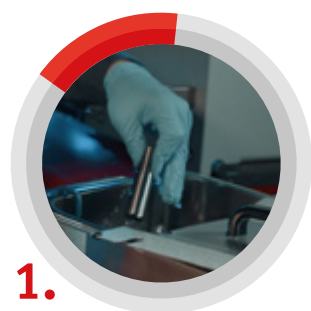
Of course, the vacuum brazing process itself is a greater challenge than, for example, brazing with a gas flame. The process including the selection of the applied brazing filler metal must be selected individually for each material and carried out with different brazing parameters (ramp, holding time, 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 3-zone vacuum chamber which can be controlled independently from one another to realize very homogenous temperatures with  $<10\text{ }^{\circ}\text{C}$  within the chamber.

To avoid evaporation of silver at higher temperatures, the unit can be equipped with a partial pressure control device. Alternatively, we can also reduce the revolution speed of the vacuum pump to decrease the vacuum quality on purpose, we only recommend this for easier to wet materials but it can decrease the process costs (no Argon used). To increase the part cooling the system can also be equipped with a nitrogen cooling fixture to reduce the total process time by approx. another 45 minutes.

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.



1.

Cleaning of parts  
e.g. with ultrasonic bath



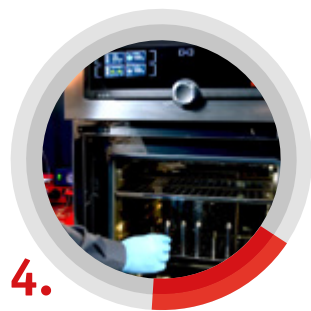
2.

Apply brazing paste or foil



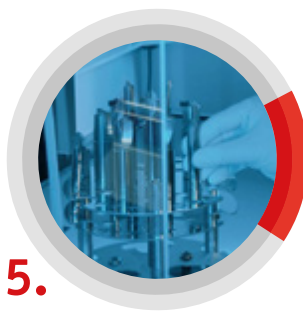
3.

Place cutting edge(s)



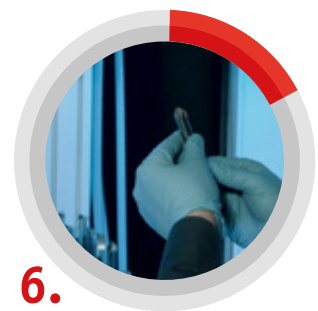
4.

Drying in predrying oven



5.

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



6.

Take and control brazed parts

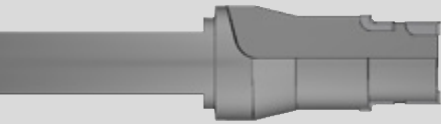
Brazing

in 6 steps



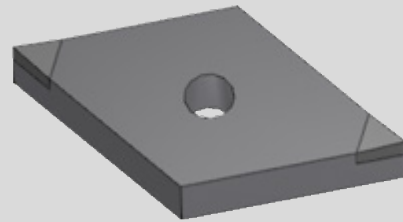
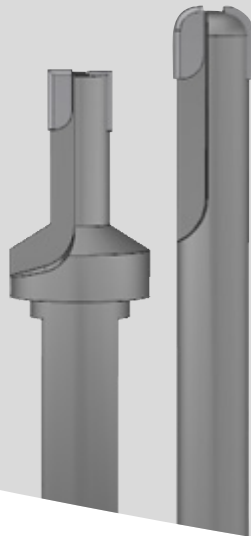
VVBM 200

## Output quantity



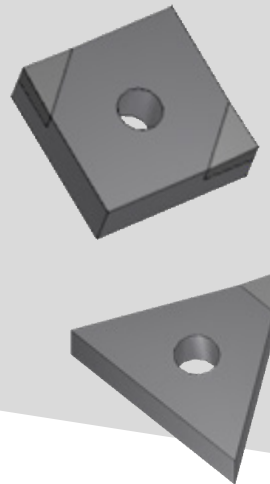
Round cutter:

50-360 parts/cycle  
200-1080 parts/shift  
600-3240 parts/day



Inserts:

500 parts/cycle  
2000 parts/shift  
6000 parts/day



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