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## Made In Germany Carburising Electric Pit Furnace



**Stock Code:** OA2269

**Manufacturer:** Made In Germany

**Model:** Carbo Drop

**Year of Manufacture:** Ref 2018

**New or Used:** Used (Second Hand)

**Internal Size (WxDxH mm):** Charge size 900 Ø x 900 high

**Max Temp:** 1000°C with cooling facility

**Other Info:** AMS2750 rev E from 500°C to 950°C

**Weight:** 5840

**External Dimensions (WxDxH):** 2.5m Ø x 2.9 m (with lid)

Carburising Electric Pit Furnace (rebuilt in 2018)

A versatile 130kW Carburising furnace utilising Homocarb© fluid to create the atmosphere. Manual or automatic operation of temperature and atmosphere set points with a maximum working temperature of 1000°C. Furnace is compliant with AMS2750 rev E includes crane system, water cooling system and Homocarb© fluid pump system. Can be used for Carburising, Nitriding, Tempering and Annealing

This is a German built pit carburising furnace with

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External dimensions 2.5 metres in diameter and 2.3 metres tall Working area dimensions of 1.22 diameter x 1.7 metres tall Maximum operating temperature: 1000°C This furnace has complied with a Temperature Uniformity Survey to AMS2750 rev E from 500°C to 950°C The furnace is rated at 130kW/2 ROB elements per phase connected in a delta configuration. Retort Internal Nickle/Chrome retort, the retort is welded to a water filled cooling ring for protection of the lid seal which sits in a groove on the top of the cooling ring. A purpose built lifting clamp is provided for convenient removal of the retort for repair or replacement. There is a Nickle/Chrome work carrier grid inserted at the bottom of the retort for placing components or baskets containing components. Ceramic fibre module insulation The Lid The furnace lid consists of two parts. The outer is flat mild steel plate while the inner is a formed Nickle/Chrome dome containing ceramic insulation that has a recess in the centre for the fan and fan shaft. The outside of the lid accommodates ports for a thermocouple, oxygen probe, methane flare off port and a fluid inlet port with site glass. At the methane flare off port there is a gas connection flame failure device and spark igniter to light a pilot flame that ignites the methane once the process has started. At the centre of the lid is a separate removable plate where the fan motor is fixed there is also two coolant connections for the fan shaft cooling jacket. There are four connection points around the lid for the connection of the supplied lifting davit. Control Systems The furnace temperature and atmosphere is controlled by a Eurotherm 2704 dual loop controller. One loop for temperature the other for carbon with a Eurotherm 3216 as an overtemperature instrument. The furnace can be operated in manual mode with manual adjustment of the furnace temperature and atmosphere set points. In automatic mode a set point programme can be run in the Eurotherm 2704 to control the temperature and atmosphere. The power to the heating elements is controlled by a Eurotherm Epower Thyristor. Atmosphere Generation The Atmosphere is created by dripping into the furnace Homocarb© fluid pumped from an SPX metering pump. The speed of the pump is automatically adjusted by the Eurotherm 2704 controller with feedback from the oxygen probe. The Carburising Operation Process Loading Load the components into the baskets making sure there is at least 12mm space between components to allow for the atmosphere flow. Assemble the baskets on top of another with the trunnions inline. When all baskets are loaded and stacked on top of one another, fit the lifting arms over the trunnions and lock in place with the locking plates. Attach the lifting bar on to the hoist hook and locate the lifting bar hooks on to the lifting arms The load is now ready to be lifted into the furnace. Check that the fluid tank is filled with Homocarb© fluid Manual Operation Close the Lid On the control instrument adjust the temperature and atmosphere set points Press the main start push button. This will close the main contactors. Press the heat start push button. The fan will start and the furnace will start to heat up. When the furnace has reached its set point value open the furnace lid using the davit controls and move the lid to the lid stand Lift the load baskets with the runway hoist and place the baskets into the furnace making sure the lifting bar is either vertical or horizontal not at an angle. Move the runway hoist out of the way and move the lid back to the furnace with the lifting davit placing the lid down onto the furnace Go to the control panel and press the pump start push button. The spark igniter will light the gas pilot light. When the temperature has reached 700°C the pump will start to operate. Wait for the furnace to reach set point temperature On reaching set point temperature check the atmosphere value when the value is 5mV below the atmosphere set point note the time. This will be the start of the carburising time. Now the furnace can be left for the duration of the carburising time. When the carburising time is complete open the lid. The fan, pump and heaters will switch off when the lid is opened. Move the lid to the lid stand and use the runway hoist with the lifting bar to lift the load out of the furnace using a steel rod to manipulate the lifting bar over the lifting arms Place the load into the cooling pot for it to cool down Automatic Operation Close the Lid On the control instrument adjust the temperature and atmosphere set points Press the main start push button. This will close the main contactors Press the heat start push button. The fan will start and the furnace will start to heat up. When the furnace has reached its set point value open the furnace lid using the davit controls and move the lid to the lid stand Lift the load baskets with the runway hoist and place the baskets into the furnace making sure the lifting bar is either vertical or horizontal not at an angle. Move the runway hoist out of the way and move the lid back to the furnace with the lifting davit placing the lid down onto the furnace Go to the control panel and press the pump start push button. The spark igniter will light the gas pilot light. When the temperature has reached 700°C the pump will start to operate. Select the program to run on the Eurotherm 2704 control instrument from the list of previously entered programs. Press the program start push button. The selected program will now run, the furnace can now be left for the duration of the program. When the program is complete the furnace alarm will sound and the load can be removed from the furnace. When the program is complete, open the lid. The fan, pump and heaters will switch off when the lid is opened. Move the lid to the lid stand and use the runway hoist with the lifting bar to lift the load out of the furnace using a steel rod to manipulate the lifting bar over the lifting arms Place the load into the cooling pot for it to cool down. The program will reset to the beginning at the end of its