

# THERMO CATALYTIC SYSTEMS LTD

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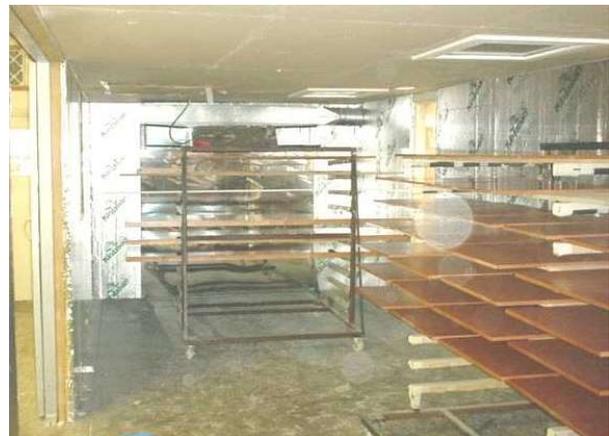
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[Bruest ATEX Certified Flameless Gas Catalytic Heaters - Industrial Oven Systems](#)

20/09/18

## SPECIFICATION : "CATBOX CONVERSION" SYSTEM (FOR USE WITH CUSTOMER'S OWN ENCLOSURE OR ROOM)



Registered in England No. 3349485

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**Bruest ATEX Certified Flameless Gas Catalytic Heaters - Industrial Oven Systems**

## **SPECIFICATION : "CATBOX CONVERSION" SYSTEM**

**(FOR USE WITH CUSTOMER'S OWN ENCLOSURE-BASED ON 2 HEATERS)**

20/09/18

***(FOR PRICES PLEASE SEE SEPARATE PRICE LIST)***

Supply only of components for a thermocatalytic "CATBOX CONVERSION" curing system using **British Gas recommended Bruest** thermocatalytic heaters. (It is envisaged that the customer will make their own curing enclosure/area and suitably insulate it (e.g. with foam filled foil-backed sandwich board).

### **PART 1: BRUEST HEATERS**

Two off **British Gas recommended**, Bruest flameless gas thermocatalytic infrared emitters, **ATEX Certified as Category 2 equipment for use in Zone 1** (and Zone 2) potentially explosive atmospheres.

The heaters will be manufactured in stainless steel for corrosion resistance in keeping with the current standards(IGE/UP/12) from the Institute of Gas Engineers & Managers, section 12.4.1. Each heater will be complete with a protective face grill, made in *stainless steel*, to I.P. 20 ("**finger-proof**") to prevent personnel from touching the hot surface of the face of the heater.

The heaters will contain pre-heating elements suitable for 230/240 v (other voltages are available). The heaters will be jetted for Natural (mains) Gas or Propane (bottled/tank) gas as required. ***Please specify fuel***

Each heater will measure approx.12"x72" (305 mm x 1,829 mm approx.) and will be rated at 36,000 Btus per hour (10.5 kW) on propane( bottled/tank) gas **OR 43,200 Btus per hour (12.66 kW) on Natural (mains) gas .**

Note: The heat output mentioned above is for a room or enclosure approx. 3-m long x 2-m wide x 2-m tall. *Larger rooms/enclosures may require a more than 2 heaters and will be specified accordingly.*

### **PART 2: HEATER FITTINGS**

#### **Electrical fittings, Per heater:**

- 1 off Explosionproof brass reducing bush
- 2 off Explosionproof brass gland
- 1 off Pair of 45 degree angle wall mounting brackets, galvanised

#### **Gas fittings, per heater:**

- 2 off 1/2" union-MxF
- 1 off 1/2" tee with 1/2" x 1/8" reducing bush and 1/8" brass pressure test point
- 1 off Gas connector hose (1/2 " B.S.P .x 1 m, **stainless steel**)
- 1 off suitable G.B. approved manual isolating lever ball valve
- 2 off nipples 1/2"
- 1 off brass trimming valve, 1/2"

*These will be provided in component form complete with CAD drawing .*

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### **PART 3: CONTROL PANEL**

The panel will be a powder-coated metal cabinet complete with engraved legends. This will monitor and regulate the various electrical inputs and outputs from the equipment ensuring adequate pre-heating and safe entry of gas to the heaters.

The system will employ an air temperature sensor, which will provide the input to a dual-display temperature controller in the control cabinet, which will display the air temperature within the room/oven and provide the output to the gas flow control manifold. This system will automatically adjust the gas flow to the heaters (working together) and use of their elements to **provide an actual air temperature in the room/oven within +/- 5°C of the control set point** (desired temperature), e.g. 35 degrees C.

At the end of the complete cycle the system will extend an audible/visual alarm to notify the operator that the cure cycle is complete. *All the above mentioned parameters (time, temperature) can be altered by a competent operator to achieve the optimum curing requirements for the coating.*

The panel will have a CAD wiring and termination drawing as standard. **The control panel will be capable of controlling an air movement system described in section 5 below.**

The panel will be supplied with 1 off type-K thermocouple and pair of male and female mini couplers for type-k thermocouple extension wire, supplied loose complete with 6 meters of suitable thermocouple extension cable.

Note : Control panels for a larger number of heaters and/or control zones will be specified on request.

### **PART 4: GAS CONTROL MANIFOLD**

One off gas control manifold for use with the control cabinet, incorporating main solenoid valve and high and low running solenoids for temperature control, manual isolator valves, trimming valve and pressure test points as required. The manifold will be made in suitable B.S.P. steel pipe. *It will be provided in component form complete with CAD drawing and will include several unions for ease of assembly and maintenance.*

The system will require:

69 cubic feet per hour of NATURAL GAS at a pressure of 3 ½” W.C.at the heaters OR  
1.96 cubic meters per hour of NATURAL GAS at a pressure of 9 mbar at the heaters

OR

29 cubic feet per hour of PROPANE gas at a pressure of 11” W.C.at the heaters OR  
1.96 cubic meters per hour of PROPANE gas at a pressure of 28 mbar at the heaters

Note : Systems involving a larger number of heaters and/or bigger heaters may require a larger manifold which will be specified on request.

## **PART 5 : AIR-MOVEMENT SYSTEM (OPTIONAL)**

To **supply only** (in component form, for self assembly and self-erection) one air movement system using self coloured spiral wound galvanised ducting.

There will be a re-circulation and extraction system. The extraction system will be complete with a filtered air intake. During one complete curing cycle, the system would complete a “Drying phase” and a “Purge Phase”.

### *Drying phase*

During the drying phase, the re-circulation system would capture hot air (generated by convection currents over the surface of the catalytic panels and re-radiation from the substrate). The air will then be re-introduced and re-circulated around the oven and over the catalytic heaters where solvent vapours will be oxidised . During the drying phase the system, which is controlled via belimos (motorised air dampers), will still bleed approx. 30% to extract.

### *Purge phase (e.g. 5 minutes)*

At the end of the “Drying Phase” the “Purge Phase” will commence, i.e. the re-circulation belimo will close and the extract belimo will open fully allowing the extract system to purge 100% of the air out of the oven via ducting from low level.

At the end of this “Purge Phase” the control system will extend an audible/visual alarm to notify the operator that the cure cycle is complete.

*There will also be an override switch that will switch off the “drying” and “purge” timers and leave the oven constantly in “drying mode*

Note : The price below is for a room or enclosure approx. 3-m long x 2-m wide x 2-m tall. Larger rooms/enclosures may require a more powerful fan and larger ductwork and will be specified on request.

## **Exclusions**

Any items not specifically included are excluded from the quotation. However, in the interest of clarity the following items are **specifically excluded**.

*Delivery, installation or commissioning.*

*Pipe*

*Cable*

*Any extraction to the exterior of the building*

*Any interconnecting pipe-fittings necessary for the pipe run,(if any) to the oven*

*Any trunking or trunking-fittings or cable tray, cable ties.*

## TOTAL GAS CONSUMPTION

*Note : The gas consumption below is calculated on a **worst case basis**, i.e. on running the system on full output all the time. In fact, because the system will modulate between high and low output in order to maintain the desired temperature, in most cases the system will only be run on full output some of the time.*

2 heaters at 43,200 Btu/hour = 86,400 Btu/hour

### Natural (Mains) Gas

The price of natural gas is usually given in pence per Therm or pence per Kilowatt. **You need to find this out from your gas company.**

2 off 12"x 72" heaters at 43,200 Btu = 86,400 Btu per hour

1 Therm = 100,000 Btu per hour, **therefor consumption is 0.864 Therms per hour**

*Alternatively, In Kilowatts:*

1 kW = 3,412 Btu/hour. Therefor

$\frac{86,400 \text{ Btu per hour}}{3,412 \text{ Btu/hour per kW}} = 25.32 \text{ kW}$ . **Therefor, consumption is 25.32 kW**

### Propane (Bottled or Tank) Gas

If natural mains gas is unavailable the system can be run on Propane gas, e.g. from 47 Kg bottles.

1 Kg of Propane contains 47,500 Btu, therefor consumption is:

$\frac{72,000 \text{ Btu per hour}}{47,500 \text{ Btu per Kg}} = 1.52 \text{ Kg of Propane per hour}$

*If the system were run flat out (see note, above) one pair of 47 Kg bottles would last just over 62 hours.*

1 litre of liquid Propane contains = 24,356 Btu, therefor consumption is:

$\frac{72,000 \text{ Btu per hour}}{24,356 \text{ Btu per litre}} = 2.96 \text{ Litre of liquid Propane per hour}$

**Trade customers may be able to negotiate significant (25%) reductions from propane suppliers' list prices, and Bulk propane from a tank is available at even lower cost.** (You may need to get a quotation from your supplier taking the hourly consumption figures as your starting point)

## **TERMS & CONDITIONS**

*While this specification is at time of writing, T.C.S. reserve the right to alter this standard specification at any time prior to order. Actual specifications will need to be confirmed at time of order. Please contact us for current pricing or a quotation to suit your needs.*

For information only, our standard terms are as follows:

The Bruest catalyst pads are guaranteed for 2 years. The standard manufacturers' warranties and guarantees will apply to all other components.

Assumed: free use of site services, customer's forklift truck.

Payment terms : 35 % with order, 25 % on advice of readiness for delivery, 30 % on delivery, 10% due 30 days after delivery- subject to approval

Delivery : **3-5 weeks** from receipt of written purchase order and mobilisation deposit subject to confirmation.

VAT: Where appropriate, VAT will be added to all the above invoices at the rate ruling applied at date of invoice.

### **EXCLUSIONS:**

- Clearance of any existing equipment
- Supply of mains electric, gas, air or water
- Any necessary building works or roof work in the area
- Off loading of goods
- Supply or provision of any equipment, support structure, services etc other than those specified within our quotation
- Supply of specialist access equipment required

### **TERMS:**

*Unless otherwise agreed in writing, the **proposal notes and terms and conditions** located at the rear of this document shall apply to any order placed by the customer. In the event of any inconsistency between these terms and those passing between the parties these terms shall prevail. No variation of the term and conditions shall be allowed unless expressly accepted in writing.*

Yours sincerely, for Thermo Catalytic Systems Ltd.

David Miller (E. & O.E.)