

# NE<sup>M</sup>ESIS

## 5000 SERIES SPRAYBOOTH & OVENS

Todd Engineering's Nemesis 5000 Series spraybooths represent cutting edge innovation and design in developing 'the only true solution' for bodyshops wanting to dramatically increase productivity, reduce vehicle movements, paint product expenditure, key to key times and energy consumption. In an industry of wide ranging solutions from movable booths to expensive accelerated paints using a variety of curing methods Todd Engineering have seen that Gas catalytic Infra-Red technology is in a position to solve many problems faced by bodyshops. At the heart of the Nemesis range of spraybooths lies the E5! A robotic gas catalytic IR Arch which is capable of not only moving along the length of a booth cabin but can also traverse width ways throughout multiple cabins, couple this with the ability to 'fully cure' panels using standard un-accelerated products in a matter of minutes - that can be reworked as soon as they are cool, and the credentials of a Nemesis set up can soon be seen. The Nemesis range can be configured as a two or three bay set up allowing a full repair process to be undertaken in the downdraught cabins.

### Layout

The 'Nemesis' is a multi-cabin downdraught type spraybooth which features a fully filtered floor area, the downdraught design ensures all overspray and dirt is pulled immediately to floor level and held there during the spraying process, this eliminates overspray contaminating other areas of the paintwork and ensures a perfect finish. The full size ceiling air input plenum helps facilitate this design by producing an even through flow of heated air that completely envelops the vehicle, meaning all areas of the car including sills are heated to the required panel temperature evenly.. The E5 Plus robotic arch runs on rails mounted on both Y and X axis throughout the cabins, allowing the robot to move between and cure products in any of the booths. Sealed electrically operated and fully automatic PVC curtains separate each cabin to prevent cross contamination, additional curtains to the rear protect the robotic arch whilst spraying is in progress.

### Construction

The spraybooth cabin is constructed using double skinned rock-wool insulated panels with a white polyester finish both internally and externally, the panels include built-in steel sections to provide support for the E5 arch, this design eliminates the need for additional framework that would encroach into the cabin and provides a flush and more complete finish. Panel sections are joined with bright aluminium sections which give a seamless and attractive finish that takes away the exposed joints that would otherwise be filled with sealant.

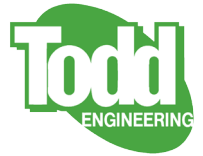
### Performance

Each cabins air handling plant is fitted with two 4kW direct drive bifurcated aerofoil axial fans to achieve the design airflow rate of 25000m<sup>3</sup>/hr. This provides a rate of 4 air changes per minute within the cabin, with extracted air being exhausted to atmosphere. The extraction system is fitted with two stage filtration incorporating 50mm EU2 paint stop filter and EU3 blue pre-filter; this ensures that emissions meet EPA requirements. Input air is filtered through high quality EU5 filter media housed in the full ceiling plenum, which captures contaminants down to 10 microns.

### Lighting

Todd Engineering have developed a state-of-the-art LED lighting system specifically for use in our range of spraybooths that meet and surpass the very highest standards required in the automotive refinishing sector. The cabin is superbly lit with high level light pods which are angled to reduce glare and shadowing, these pods are outfitted with a state-of-the-art LED lighting system that gives illumination levels in excess of +1800 lux through the use high output LED SMD Chips designed to give colour temperature of 5000K @ 90CRI which offers unrivalled lighting quality when colour matching. These LED's consume 50% less energy than conventional tubes with an equivalent light output and operate via an external low voltage driver at 36VDC. The lighting is fitted with a hi-tech laser etched 'Luminit' film which removes the visual appearance of each individual LED and creates a flat panel of light which is distributed and angled to prevent glare and shadowing. The light pods are finished with a frameless toughened glass cover and intumescent seal to separate electronics from the booth atmosphere.

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### **Spraying Cycle**

Fresh air is drawn from the atmosphere & is heated to the required temperature. It then passes through EU5 ceiling filters into the booth & over the vehicle carrying away paint over-spray & vapours. The air is extracted via a twin dry filter system & exhausted to atmosphere. By using recommended filters with regular changes, 99% of pollutants can be captured.

### **Heating**

The spraybooth is fitted with a state of the art direct fired modulating gas/LPG premix burner with an output of 170kW or 580,000Btu's/hr; this allows input air to be rapidly heated to the pre-set temperature on the control panel, cabin temperature is then held within +/- 1 degree.

### **Noise Levels**

Comfortable working cabin levels of between 60-65 dB, variable speed motors contribute to 50% lower dB outbreak levels.

### **Main Doors**

The main vehicle entry doors are a three leaf construction that open in a concertina fashion which saves space on the doors overall opening distance. Door Hinges have been designed specifically for application in spraybooths and are made through aluminium extrusion in a white powder coated finish, white plastic cover plates then cover the fixing bolts to complete the look of the hinge. Two individual locking mechanisms allow one single leaf door to be used as a second personnel door; this is fitted with a self-closer and dictators to provide a good seal. The door frame has a white powder coated finish and a built in rubber compression seal, each door has a large full length glass viewing panel framed in aluminium increasing internal booth visibility.

### **Personnel Door**

A second personnel door in each cabin can be fitted, generally to the rear of the cabin to provide a safe fire escape route. The door is fitted within its own white powder coated frame complete with self-closer, dictators, full length viewing window, extruded aluminium hinges and rubber compression seals.

### **Control Panel**

The Spraybooth control system is fully integrated with the E5 Robot for seamless and reliable operation, it uses the latest technology available to give the operator intelligent and user friendly control of all processes in each cabin. Simple push button controls are used for cycle selection and lighting, meaning in most cases the booth can be controlled with one touch of a button. The intelligent programming of the PLC based system monitors and adjusts cabin pressure and temperature to suit and displays the current spraybooth status on a 3.5" full colour TFT Touchscreen display. Separate controllers for temperature and cycle time duration are fully adjustable by the operator and give clear indication of set points, current temperature and remaining process time.

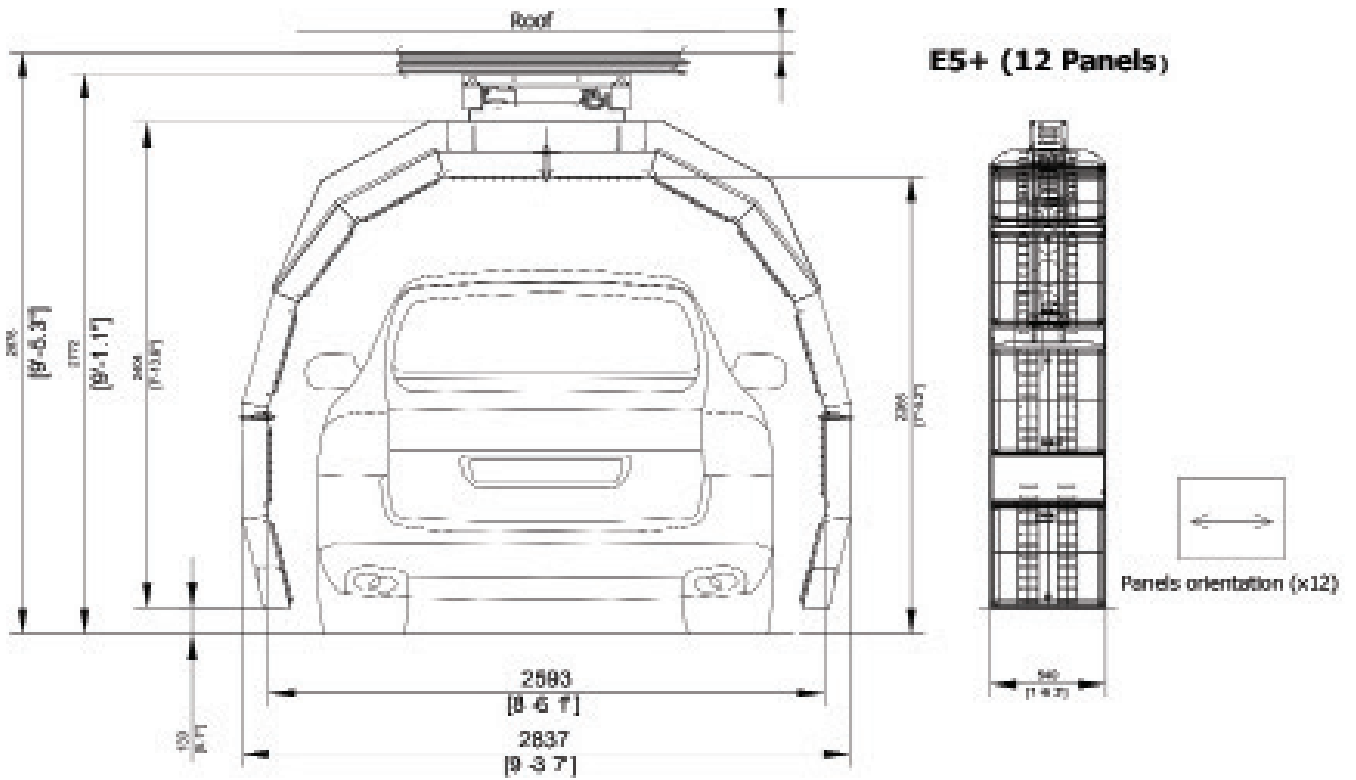
### **Inverter Variable Speed Drives**

All Todd Engineering spraybooths are fitted with Inverter variable speed drives to electronically balance cabin pressure, this is achieved by controlling the fan speeds using the inverters. This method of control is beneficial in maximising the energy efficiency of the spraybooth by only running the fans at the speed required by the process. The inverters also increase the life expectancy and reduce maintenance of all associated components including the motor, drive shafts, and bearings through controlled acceleration and deceleration of the motors, this also eliminates electrical surges as the spraybooth is started.



<b>Nemesis Specifications</b>	
Standard Model Overall Dimensions (LxWxH) - Internal	6900mm x 3900mm x 2600mm
Standard Model Overall Dimensions (LxWxH) - External	7660mm x 3900mm x 3000mm
Power Supply / Load	400VAC 3Ph/N/E (50/60Hz) / 32A
Maximum Absorbed Power	10kW
Gas Supply	Natural Gas or LPG
Gas Rated Power (kW/BTU'S)	170kW/580,000BTU's/hr
Natural Gas Consumption	12m <sup>3</sup> /hr
LPG Consumption	6kg/hr
Pneumatic Supply	5 bar
Airflow	25,000m <sup>3</sup> /hr
Extraction Type	Downdraught
Fan Type / Rated Power	Bifurcated Aerofoil Axial / 4kW
Inverter Variable Speed Drives	Yes
LED Lighting	Yes - 5000K/90CRI/+1800lux

## E5-Dimensions {detailed below}



E5 Plus Specifications	
Overall Dimensions (WxHxD)	2837mm x 2980mm x 540mm
Quantity of Catalytic Panels	12
Weight	350kg
Power Supply / load	400VAC 3PH/N/E (50/60Hz) / 32 A
Maximum Absorbed Power	8kW
Radiant Surface	2.4m <sup>2</sup>
Gas Supply	Natural Gas or LPG
Natural Gas Rated Power (kw/BTU's per hour)	45kW / 154.368BTU's
Natural Gas Consumption	4.7m <sup>3</sup> /hr
LPG Rated Power (kw/ BTU's Per Hour)	46kW / 159.743BTU's
LPG Consumption	3.67kg/hr
Pneumatic Supply	6 bar