



Metallisation
thermal spray **solutions**

Introducing

MET CELL



A complete thermal spraying solution

INTRODUCING THE MET-CELL

A complete automated thermal spray system for any process, designed with modular packages in order to create a turnkey solution to meet your production needs.

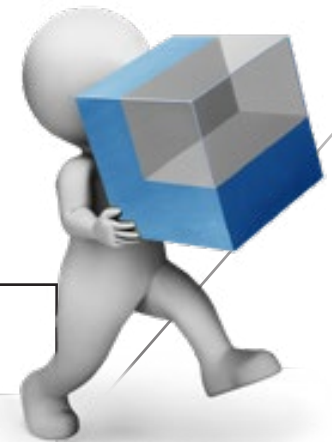
MET-CELL has been designed to ensure that automating your production process is as easy and cost-effective as possible, whilst maintaining exceptional coating results. Each cell can be individually configured using versatile, modular packages and options. Whatever material, MET-CELL is flexible to adapt to your production needs and thermal spraying processes and deliver repeatable, quality coatings at an improved rate.

Take a step toward Industry 4.0, using robot technology and feedback systems combined with an integrated positioner, MET-CELL is flexible and versatile enough to handle any part or assembly.

INNOVATIVE
thermal spray
SOLUTIONS
since 1922



Metallisation offers professional support from the planning of your thermal spray solution through to service with an exceptional product portfolio



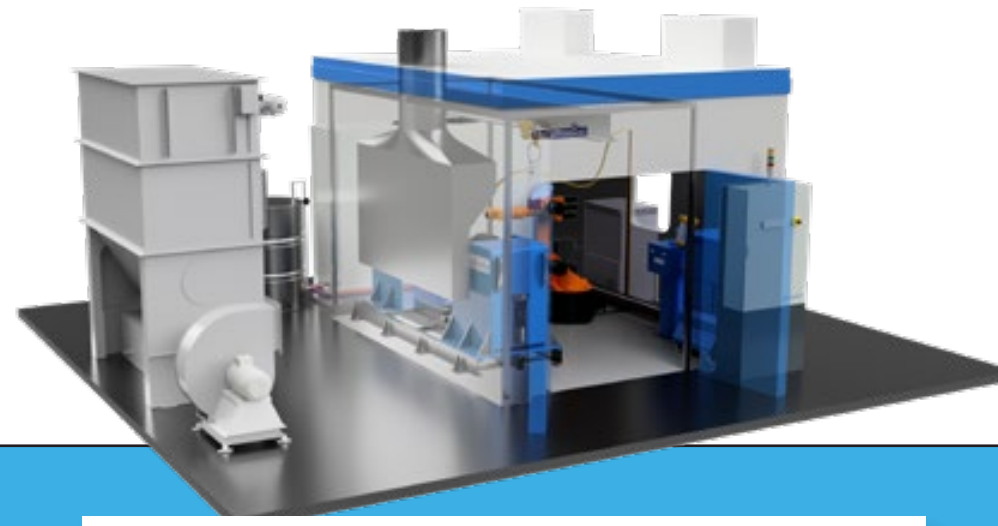
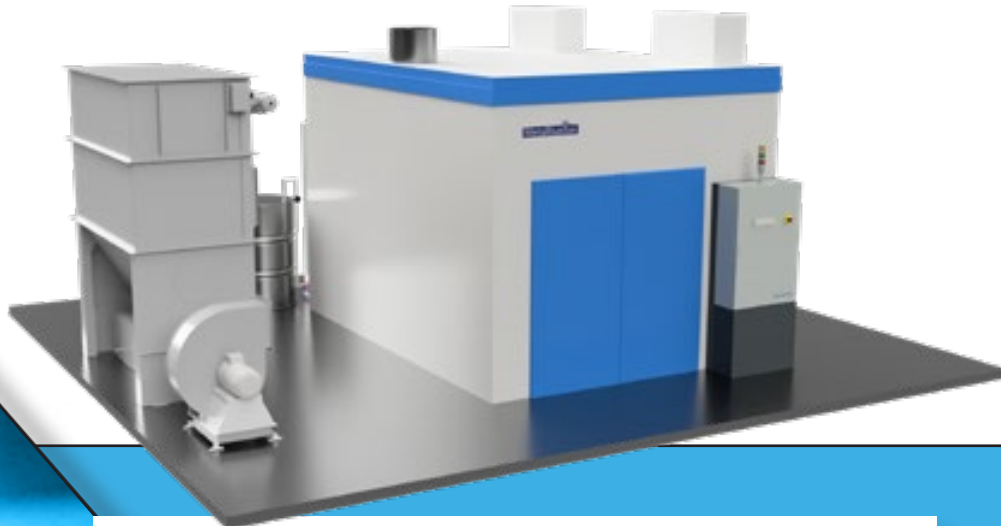
MET-CELL is a modular turnkey solution that adapts to all your thermal spraying needs

PROFESSIONAL

SUPPORT



System Overview



Knowledgable Cell Design

- ✦ Modular optional equipment provides customisable optimal solution.
- ✦ Industry 4.0 technology for intelligent operation improving production & repeatable quality whilst reducing operator risks.
- ✦ Compact niche design for ease of transportation & installation.



Premium Performance & Quality

- ✦ Repeatable precision spraying = high quality coatings. Increased & consistent productivity, eliminating variable duty-cycles.
- ✦ Live monitoring & feedback systems on consumables & faults reduce or prevent downtime.
- ✦ Optional network connectivity for online diagnostics & monitoring.
- ✦ User friendly interface requires limited training & job knowledge.



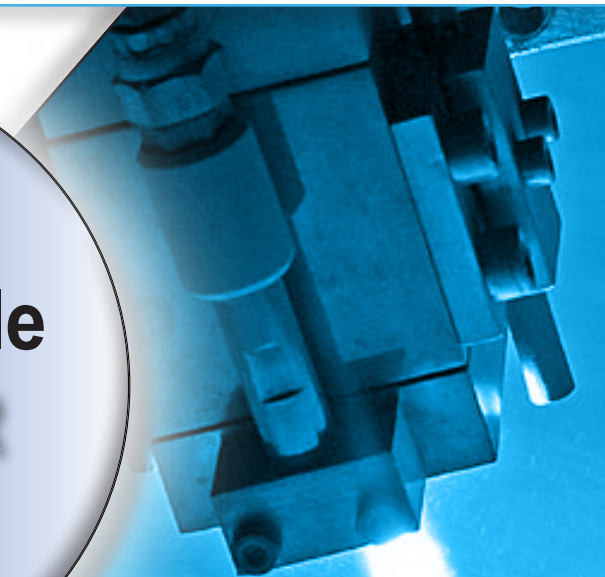
Integrated Technology

- ✦ Field proven design, technology & equipment.
- ✦ Thermal spraying since 1922.
- ✦ Compact niche design for ease of transportation & installation.
- ✦ Thermal spray OEM

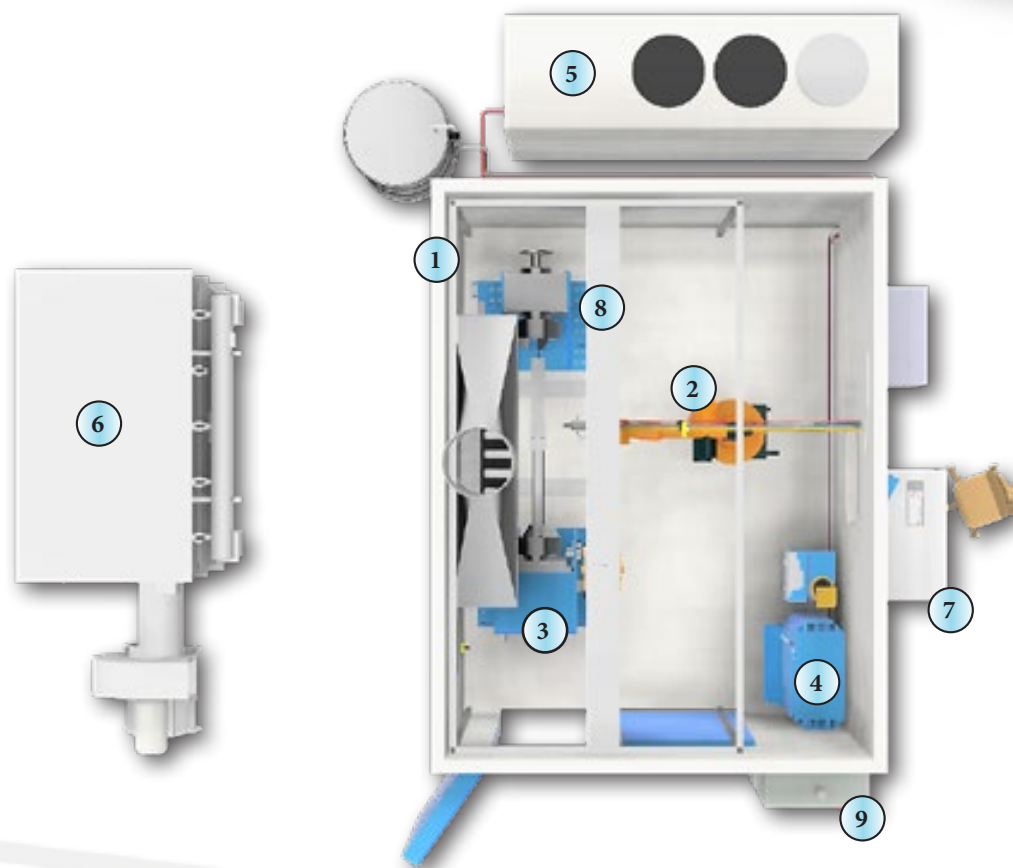
FIELD PROVEN

ERGONOMIC CONTROL

**A fully
customisable
MODULAR
system**



Scope of Supply

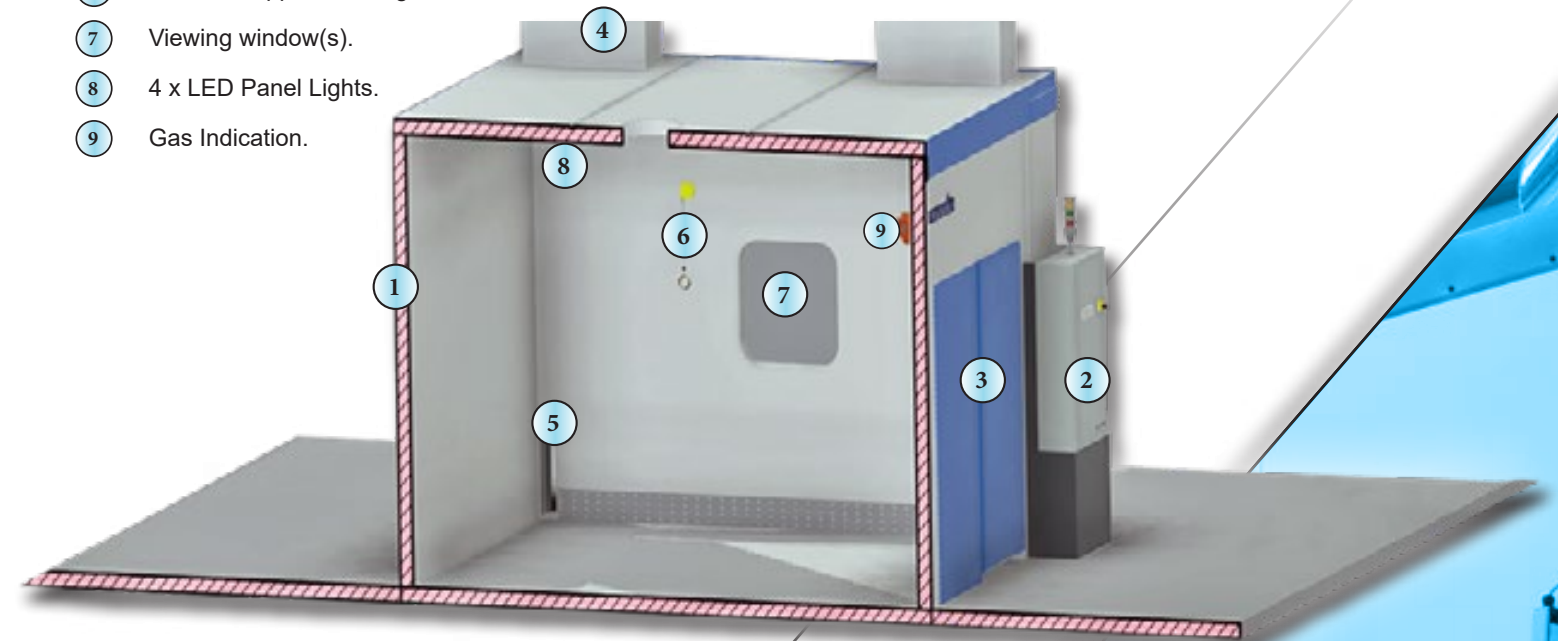


Acoustic Booth



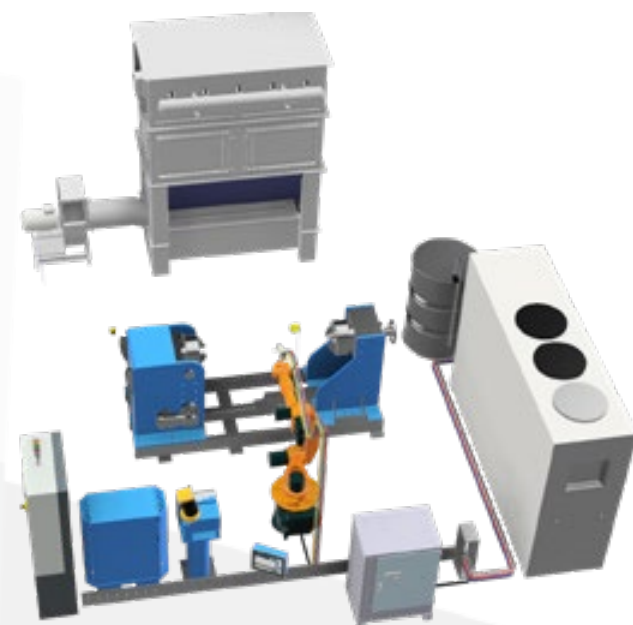
OVERVIEW

- ① Dimensions 4m(l) x 3m(w) 3m(h).
- ② Booth controller with safety interface.
- ③ Dual leaf doors positioned for easy loading of components.
- ④ Noise attenuated air inlets.
- ⑤ Acoustic entry tunnel.
- ⑥ Cable & supplies management.
- ⑦ Viewing window(s).
- ⑧ 4 x LED Panel Lights.
- ⑨ Gas Indication.



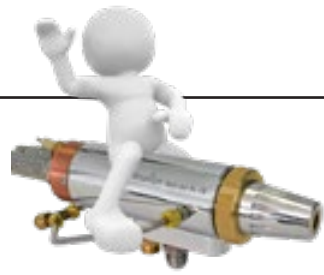
COMPRISING

- ① Acoustic booth.
- ② Kuka Robot & Controller.
- ③ Rotating head and tailstock.
- ④ Metallisation Thermal spray system.
- ⑤ Chiller and heat exchanger.
- ⑥ Extractor and Dust collector.
- ⑦ Operator workstation.
- ⑧ Overhead crane.



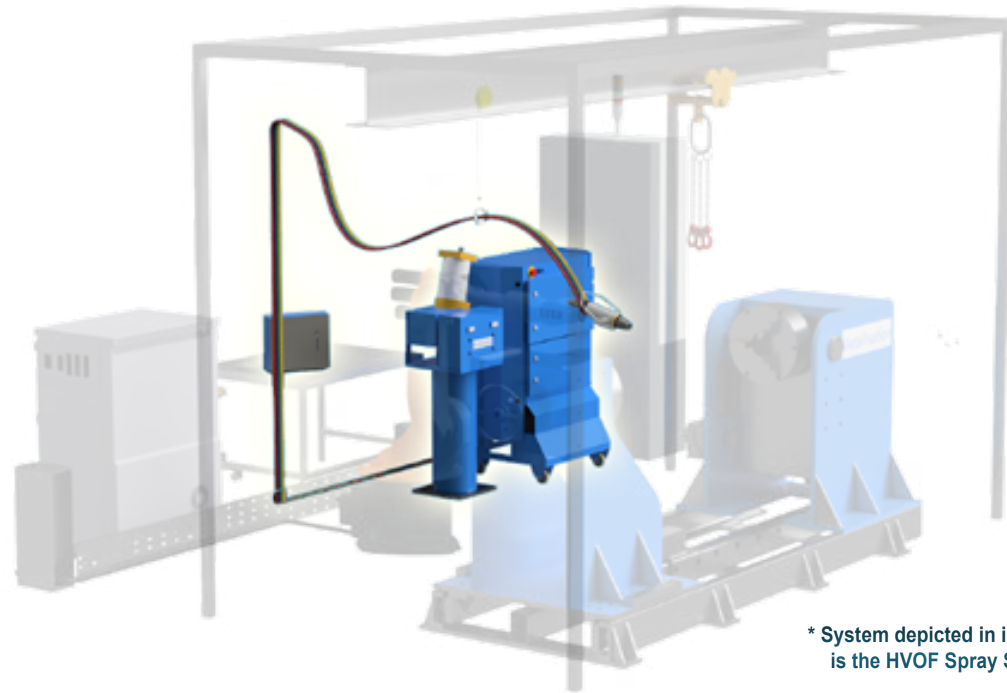
High
quality
BESPOKE
design

Metal Spray Equipment

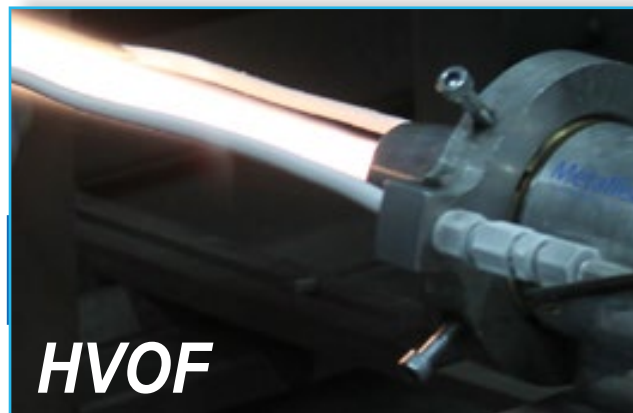


At the heart of each Met-Cell is Metallisation's Thermal Spraying Equipment. A robust, high quality, proven system

designed and built in the UK & selected in order to deliver a solution that meets your exact spraying needs.



* System depicted in illustration is the HVOF Spray System.



SYSTEM FEATURES

- Complete Metallisation thermal spray system including pistol, supplies, console, Touch-screen and keyboard Interface and wire/powder feeder.
- Positioned taking advantage of cable management trays & tool balance keeping the spray area clear.
- Ready to run.
- Mass flow control of gases = repeatability.
- Unlimited recipes and parameter recording.
- Manual or fully sequenced start-up, operation and shut-down.
- Safety interlocks to prevent running without coolant and gases.
- Other powder feeders can be interfaced.
- Fault indication strobe.
- Enclosure allowing supplies to exit to the front, rear or sides of the gas box.
- Additional powder feeders/power sources can be interfaced
- Full, on screen diagnostics to advise operator of the system status.

Whatever the application or Thermal spraying need, Metallisation has the solution for you. Our diverse and high quality range of equipment coupled with our catalogue of consumables, extensive experience and technical knowledge means we can deliver the complete package.



HMI FEATURES

- Integrated PC with 17" touch screen, mounted in an industrial box with standard VESA mount.
- Security levels, password protected for operation or programming.
- Comes with Windows7 as an operating system that is widely familiar.
- Parameter trending allows real-time monitoring of operation and setting of 'out-of 'range' limits.
- Real time data logging with programmable intervals. System logs the required parameters and actual operating parameters (gas flows, powder feeder speeds, voltage, current) against time and also logs sequence events and faults.
- Data log output via .csv data format through USB or Ethernet to enable remote SPC analysis.
- Full, on screen diagnostics to advise operator of the system status.



Intuitive
human
MACHINE
interface



Equipment Manipulation



Workpiece Manipulation

FEATURES

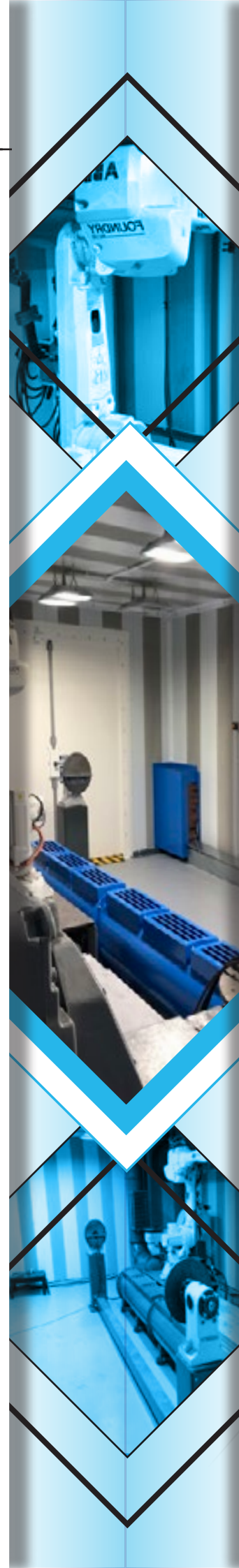
- Rotating head and tailstock.
- Option for tilt function converting to "rotator".
- Positioned for ease of loading.
- Variable speed.
- Upto 1.5m workpiece length.
- Flexible and durable.
- Proven design in other successful projects.
- Guard plates reduce damage to floor.



Robotic Manipulation

FEATURES

- Kuka CYBERTECH KR16 robot shown (other models & manufacturers available on request).
- Flexible range of motion.
- Provides repeatable process.
- High speed smooth and sensitive motion allows for increase in production rates whilst maintaining precision
- Multiple programs can be stored to allow variety on component combinations and low volume production with minimal downtime.



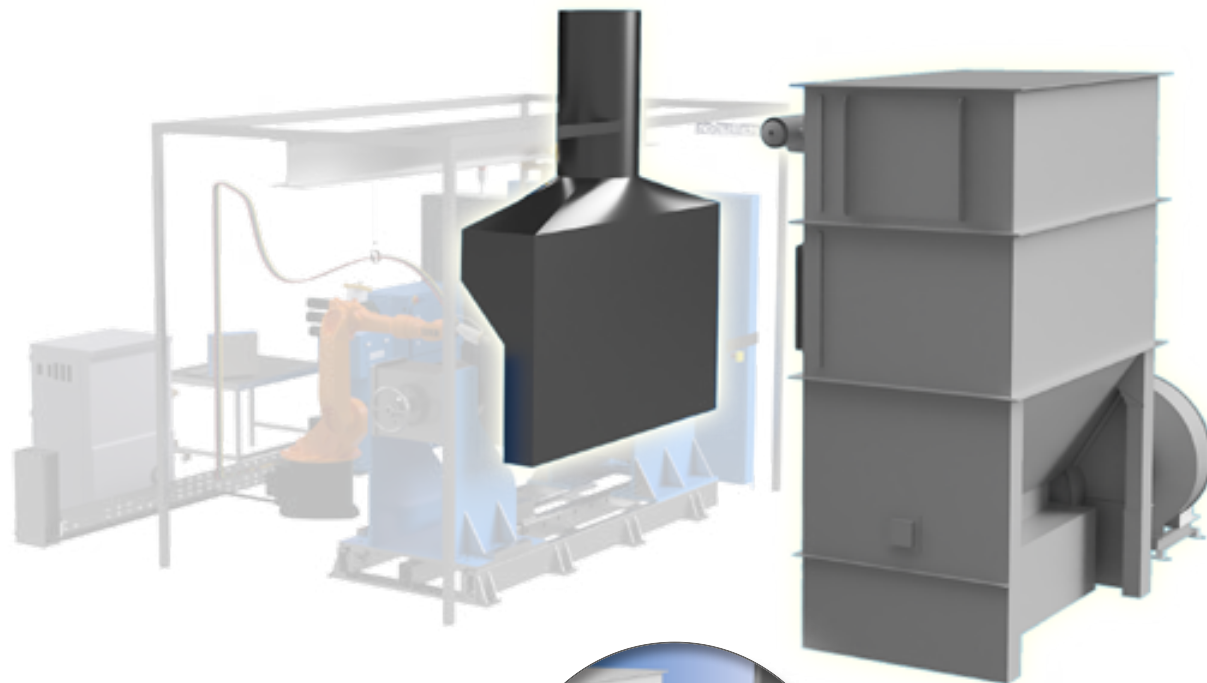
The Met-Cell design allows for a flexible work approach allowing a variety of component shapes and sizes to be sprayed easily and quickly by combining the robot and rotating manipulator to work in unison, delivering exceptional quality every time.

Flexibility
control &
PRECISION
in unison



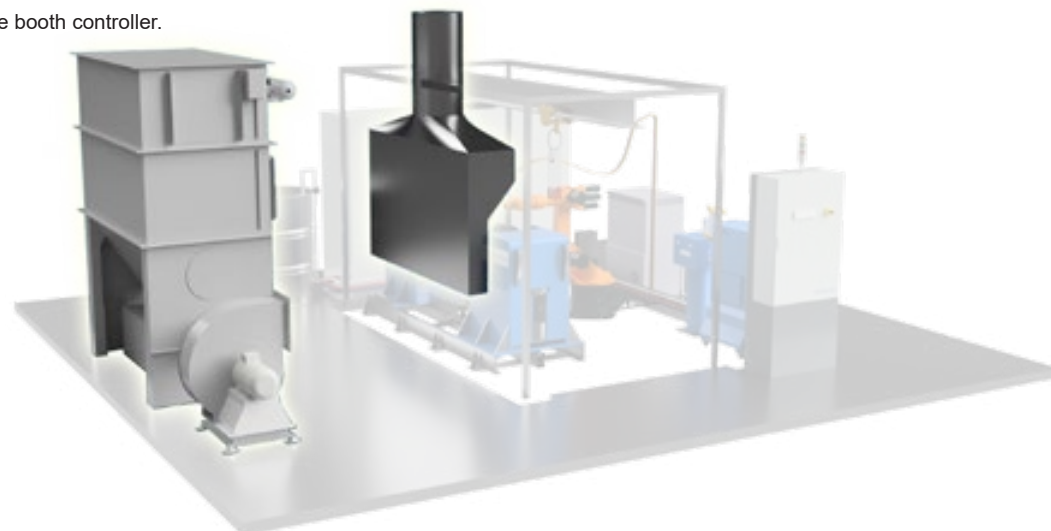
Extractor & Dust Collector

Excessive dust & fume levels are no more with our high velocity, reliable, self-cleaning extraction system



FEATURES

- Slotted plenum mounted behind rotator, directing airflow across the spray area.
- Dust collector able to be mounted in/outside subject to site conditions.
- Includes 10m of unsupported duct from roof outlet to dust collector.
- Designed exclusively for our process.
- Safety circuit integration with the booth controller.
- Where required for flammable / explosive materials, a relief panel & slam-shut valve shall be included (additional charge).



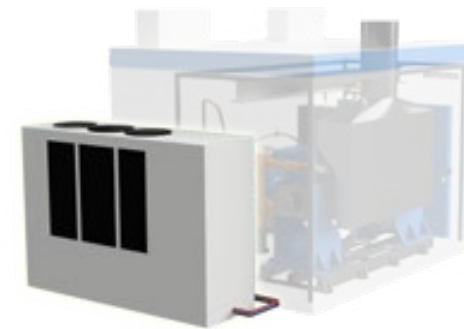
Chiller & Heat Exchanger

An essential part for HVOF/PLASMA processes



FEATURES

- Self contained system, including all control elements.
- Despatched with a running charge of refrigerant.
- Cool water is produced within the chiller and used to cool the pistol via a heat exchanger.
- Demineralised water is pumped to the HVOF system via an integral pump.
- Units are designed to run continuously and will circulate chilled water as long as the unit is switched on.
- Positioned at the rear of the booth (subject to site limitations) allows easy piping through the acoustic tunnel.
- Typically for indoor use (discuss at order placement).



Complete
factory
ASSEMBLED
unit

Overhead Crane

Loading
&
UNLOADING
with ease

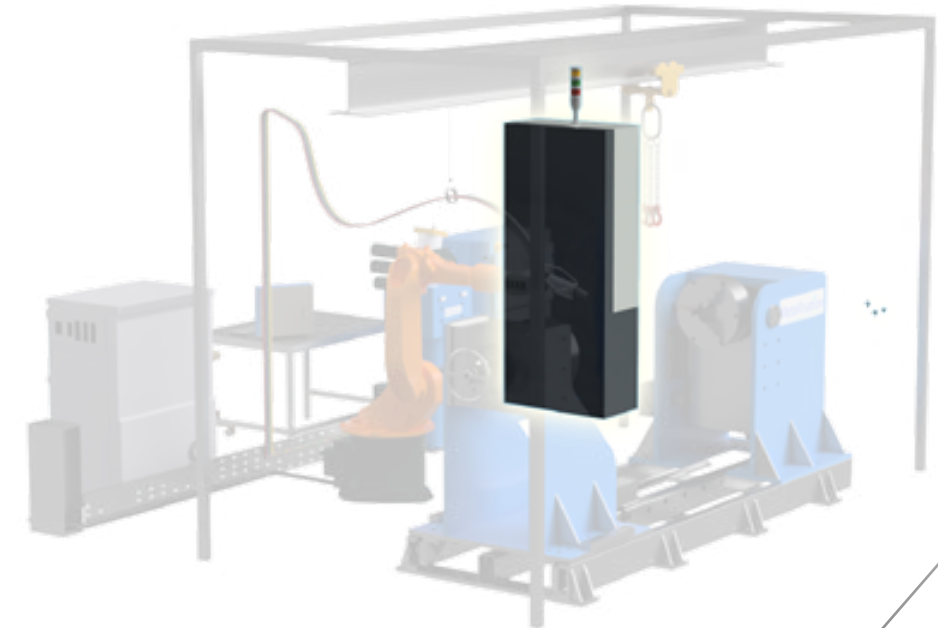


FEATURES

- ✦ Able to move on both X and Y axis.
- ✦ Positioned to allow unobstructed loading through doors via customers forklift / pallet truck.
- ✦ Robot "park" position for loading and unloading.
- ✦ Rated at 1.5t.
- ✦ Powered System.



Booth Controller



FEATURES

- ✦ Enclosed cabinet containing all PLC's and control modules fitted to industry standard rails.
- ✦ Single point access for electrical inspection and maintenance
- ✦ Option for electrical distribution board complete with standard MCB's and wiring.



Inclusions & Considerations



Metallisation is dedicated to providing the best possible service, before and after the point of sale. The below list highlights some of our specialist support & after sale inclusions that will further enhance your purchase.



INCLUDING

- Met Serve - Our inspection, servicing and maintenance programme
- System training
- Manual thermal spray training
- Operator qualification
- Accreditation.
- Application Engineering.

Detailed Specifications



Key Information	
Length	4000 mm (157 ")
Width	3000 mm (118 ")
Height	3000 mm (118 ")
Noise Reduction	1m <85 dBA

Acoustic Booth

DETAILED SPECIFICATION

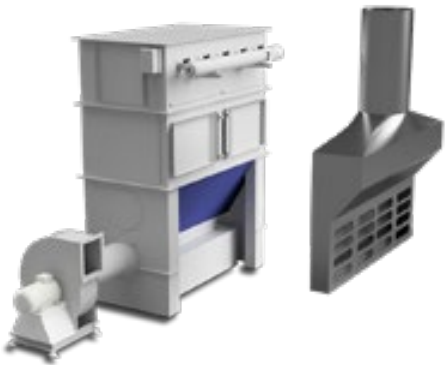
- Modular Panel Construction with 1.5mm mild steel outer panel, 1 5mm soundboard, 80mm thick rockwool with flexible membrane and 1.5mm perforated sheet.
- Powder coated finish.
- Dual access door with 500mm x 500mm viewing window (tinted for PLASMA).
- 1 x 500mm x 500mm side viewing window (tinted for PLASMA).
- 1 x 1500mm wide x 1500mm high x 600mm deep exhaust hood with profiled slot and removable blanking plates.
- 2 x Roof mounted sound attenuated air inlets.
- 4 x LED Booth lights with interconnecting wiring.

As with any turnkey project there will be several site specific exclusions to the scope of supply. The below list highlights some of these considerations as a helpful checklist when planning the installation.



CONSIDERATIONS

- Preparation of site area, including demolition, earthworks and any structural modifications.
- Any necessary builders/civil works (cutting holes in external walls) or civil engineering/design.
- Suitable reinforced concrete plinth for the Dry extraction unit and chiller.
- Removal of any existing equipment.
- Sound insulation of the ductwork and or fan unit, if required.
- Installing electrical service including power distribution, breakers, disconnects Sockets, etc.
- Delivering electrical power to the specified drops for the components.
- Supplying compressed air, gases, fuels include tanks, at the required pressures and flows.
- Plumbing of air, gas, water and fuel lines to the specified drops for the components.
- Responsibility for providing and preparing a level floor area for the Extraction system, Chillers and the Acoustics Spray Booth (+/- 5mm over the complete area).



Key Information	
Fan Duty	12,000m³/hr @ 300mm wg
Motor Power	15kw, 415v 3ph 50Hz
Weight	2750kg across four point loads
Atex	Zone 2 internal only

Extractor & Dust Collector

DETAILED SPECIFICATION

- Sixteen 23.5m² non-woven polyester filter cartridges.
- Reverse Jet Cleaning System.
- Compressed air supply filter regulator, supplied loose to be installed by others.
- Magnehelic pressure differential gauge.
- Discharge hopper with 110litre dust collection bin.
- Mild steel construction, painted blue or to your specified colour.
- Weight – 2750kg across four point loads.

Detailed Specifications



Metallisation HVOF Spray System



Key Information (HVOF System)

High grade premium paraffin	BS2869 Part 2:1988 Class C1
Oxygen	1200 l/min (2543 scfh) @ 21bar (305 psi)
Nitrogen	25 l/min (53 scfh) @ 4 bar (58 psi)
Coolant – deionised water	28 l/min minimum to 34 l/min (7.4 to 9 US Gal/min) maximum thru the system @ 5.5 – 7.5bar (80 – 109 psi)
Max. coolant inlet temperature at the pistol	17 degrees Celsius (62.6 Degrees Fahrenheit)
Max. coolant return temperature from the pistol	56 degrees Celsius (132.8 Degrees Fahrenheit)
Electrical	240/110V 1ph, 8A/15A
Weight	Gas box – 100kg (220.5 Lbs) Operator interface – 20kg (44.1 Lbs)
Dimensions (mm)	Gas box – W-860 (33 ¾”) x D-560 (22”)x H-1250 (49 ¼”) Operator interface – W-560 (22”) x D-175 (6 ¾”) x H-410 (16”)
Cooling requirements	90kW (307,349 BTU/Hr (25.61 Ton) at 30 degrees C (86 Degrees Fahrenheit) ambient

Key Information (Met-Jet4L Gun)

Weight – JET4L-100	4 kgs (8.8lbs)
Dimensions – JET4L-100 (mm)	L-400 x W-160 x H-120
Weight – with 200mm nozzle	4.4 kgs (9.7lbs)
Dimensions – with 200mm nozzle	L-500 x W-160 x H-120

System Specification

- ✦ Mass flow control of oxygen and carrier gas = repeatability.
- ✦ Easy to use, intuitive operator interface.
- ✦ PC control with touch screen operator interface.
- ✦ Optional keyboard control or operator interface unit.
- ✦ Unlimited recipes and parameter recording.
- ✦ Manual or fully sequenced start-up, operation and shut-down.
- ✦ Liquid fuel = thick, low stressed coatings.
- ✦ High hardness, low oxide level coatings.
- ✦ High bond strength and low porosity coatings.
- ✦ Safety interlocks to prevent running without coolant and gases.
- ✦ Other powder feeders can be interfaced.

Gun Specification

- ✦ Optimised, single point fuel injection system to promote a complete, clean burn within the combustion chamber.
- ✦ Two nozzle lengths available, 100mm and 200mm enable a wide range of coating properties to be achieved from hard but ductile coatings to extremely hard but more brittle coatings.
- ✦ Very simple nozzle design reduces consumable spares costs.
- ✦ Simple pistol maintenance for reduced downtime when changing consumables.
- ✦ Steel powder feed tubes for reliable operation – do not melt in operation.
- ✦ Robust chamber pressure transducer provides accurate feedback directly from the chamber.
- ✦ Sturdy, robust design for long service life.
- ✦ Robot mounting interface.

Detailed Specifications



Metallisation PLASMA Spray System



Key Information (PLASMA System)

Primary gas – Argon	100 l/min (max) @ 4-8 bar
Primary gas – Nitrogen	100 l/min (max) @ 4-8 bar
Secondary gas – Nitrogen	15 l/min @ 4 bar
Secondary gas – Helium	80 l/min @ 4-6 bar
Secondary gas – Hydrogen	15 l/min @ 4-6 bar
Coolant – deionised water	14 l/min thru the PL50 Plasma Pistol @ 6bar.
Max. coolant inlet temperature at the pistol	16 degrees Celsius
Electrical	240/110V 1ph, 8A/15A
Weight	Gas box – 100kg (220.5 Lbs) Operator interface – 20kg (44.1 Lbs)
Dimensions (mm)	Gas box – W-860 (33 ¾”) x D-560 (22”)x H-1250 (49 ¼”) Ignition box – W-400 x D-300 x H-500 (wall mount) Operator interface – W-560 (22”) x D-175 (6 ¾”) x H-410 (16”)
Cooling requirements	35kW at 30 degrees C ambient

Key Information (PL50 Gun)

Weight – PL50	1.76kg (3.87lbs)
Dimensions – PL50 (mm)	L-158 x W-80 x H-70
Weight – PL50-90	1.76kg (3.87lbs)
Dimensions – PL50-90 (mm)	L-103 x W-80 x H-124

System Specification

- ✦ Mass flow control of primary, secondary and carrier gases = repeatability.
- ✦ Inverter power supply = stability.
- ✦ Easy to use, intuitive operator interface.
- ✦ Optional keyboard control or operator interface unit.
- ✦ Unlimited recipes and parameter recording.
- ✦ Manual or fully sequenced start-up, operation and shut-down.
- ✦ Various straight, angled and extension guns can be used.
- ✦ Internal and external powder ports.
- ✦ Safety interlocks to prevent running without coolant and gases.
- ✦ Argon or Nitrogen primary, Helium, Nitrogen or Hydrogen secondary gases.
- ✦ Other powder feeders can be interfaced.

Gun Specification

- ✦ Compact design for small access areas.
- ✦ 90 degree option for use with a manipulator or robot.
- ✦ 50kW capacity (suited for the majority of plasma spray applications).
- ✦ Internal and external nozzles allow optimum parameters for a range of materials.
- ✦ Simple pistol maintenance for reduced downtime when changing consumables.
- ✦ Ample cooling allows extended lifetime of consumables
- ✦ Optional cooling jets can be fitted to the pistol
- ✦ Argon Primary gas and Nitrogen, Hydrogen secondary gas.
- ✦ Robot mounting interface.

Detailed Specifications



Key Information

Rotation axis	-185 ° + 185 °
Maximum reach	1612 mm
Max height from ground	1972 mm
Footprint	430.5 x 370 mm
Weight	245 kg (approx)
Electrical	32 Amp / Phase (3) 380/400/440or 480 V

Kuka KR16 Robot & IRC Controller

DETAILED SPECIFICATION

- 6 axis.
- 16 kg robot payload.
- Digital 16 I/O.
- Protection Rating IP65.
- KR C4 controller.
- Pose repeatability ±0.04 mm.
- 5 - 55 °C operating ambient temperature.



Key Information

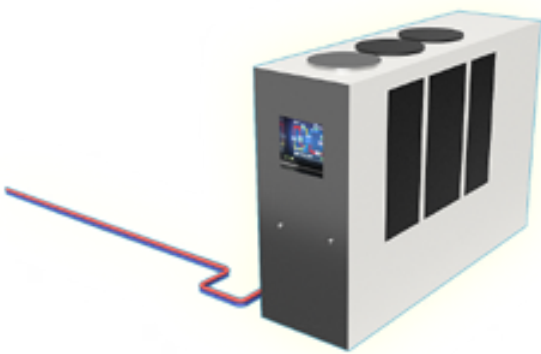
Width	3.3 m
Depth	1.15 m
Height	1.6 m
Electrical	16 Amp / Phase (3) 415 V
Height to Centre Line	1.376 m

Rotating Head & Tailstock

DETAILED SPECIFICATION

- Max work piece length 1.5 m.
- Max work piece Ø 400 m.
- 50 - 600 rpm.
- Max component weight 1.5 T.
- Inverter drive for speed control.
- 3 jaw chuck.
- Moveable tail stock.
- E-Stop interface.
- Tilting head stock 90 °.
- Spring loaded tail stock.

Detailed Specifications



Key Information

Thermal Duty	87 kW
Electrical	80 Amps/Phase @ 415 V
Weight	1300 kg
Dimensions	866(w) x 2955(l) x 2005(h)

Chiller & Heat Exchanger

Detailed Specification

- Ambient air temperature up to 45 °C
- Demineralised water "process".
- Full R410A refrigerator charge.
- IP54 protection rating.
- 350 ltr water buffer vessel.
- Low ambient kit.
- Twin fill and vent tanks.



Key Information

SWL	Max 1.5 T
Power Requirement	16 A, 3 Ph @ 50 Hz
Travel Type	Powered

Internal Gantry Crane

Detailed Specification

- Free standing gantry within booth.
- Maximum rating 1.5 T SWL.
- Attached pendant for motion control.
- 'Festoon' power system with 'C' tracks for cable organisation.
- Driven axies for easy manipulation.



Key Information

Power Requirement	400 v 3 Ph @ 50 Hz
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Booth Controller

Detailed Specification

- Main isolation point.
- Extraction operation.
- Run & fault indication.
- Safety circuit integration.
- Runtime meter.

Notes

Notes





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thermal spray **solutions**

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