

Metallisation

Thermal spray equipment and consumables



Equipment Specification

ARC150/S500-CL Arc Spray System

TYPICAL SYSTEM CONFIGURATIONS

Pictured below is a range of typical system configurations. Variations of these configurations may be possible. Contact Metallisation to discuss your specific application requirements.

STANDARD CONFIGURATION – PUSH/PULL WITH WIRE IN DRUMS

Most commonly used for in-house or on-site anti-corrosion applications where drums can easily be handled.



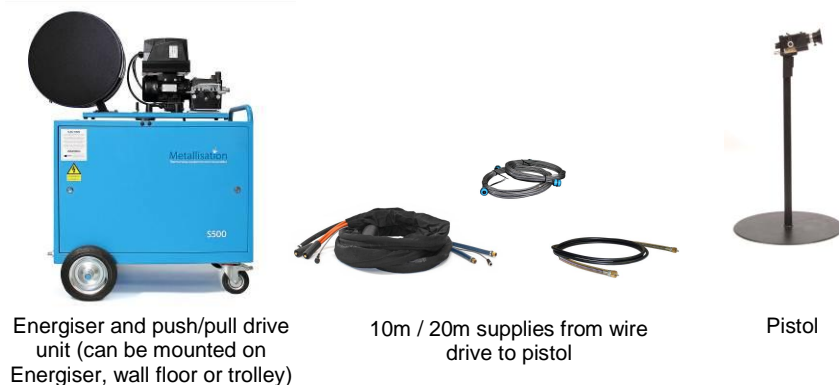
STANDARD CONFIGURATION – PUSH/PULL WITH WIRE ON MIG REELS

Most commonly used for on-site anti-corrosion applications where loading of the smaller MIG reels is more feasible than using drum material.



STANDARD CONFIGURATION – PUSH/PULL WITH WIRE ON HARDBOARD REELS

Most commonly used for on-site anti-corrosion applications where loading of Hardboard reels is more feasible than using drum or MIG material. Hardboard reels are common in some markets and allow a larger amount of wire to be held on the reel than traditional MIG reels.



EXTENDED CONFIGURATION – PUSH/PULL WITH WIRE ON MIG REELS

Most commonly used in hard to reach areas such as boilers/vessels where access for the energiser is limited. Hardboard reel variant can also be offered on the trolley.



Energiser



Extension Supplies



Push/pull drive unit and MIG reels on power extension trolley with quick release connections



Supplies from wire drive to pistol



Pistol

EXTENDED CONFIGURATION – PUSH/PULL WITH WIRE IN DRUMS

Most commonly used for very long access applications where there is a benefit to remotely site the energiser away from the spraying area and maintain the benefit of having wire in drums.



Energiser



Extension Supplies



Push/pull drive unit on power extension trolley with quick release connections



Supplies from wire drive to pistol



Pistol

TYPICAL EXTENDED SUPPLIES CONFIGURATION

Extended supplies	Pistol supplies	Total Max
10m	10/20m	50m
20m		
30m		
40m	10m	

Note:

Maximum total supplies pack length is 50m. This can be a combination of 30+20 or 40+10

INTRODUCTION

The following specification covers the standard range of ARC150/S500-CL Arcspray systems. For the specific offer, please refer to a detailed quotation and cross-reference the part numbers for each piece of equipment.

In response to feedback from customers for flexible system but with higher throughput than our 350A systems, we have created the 500A, ARC150/S500-CL system. Customer feedback has also suggested that in some situations, 600A and 700A systems are heavy (due to required cable capacity). They are also difficult to control an even coating thickness at times due to the high throughput rates when hand spraying complex structures. For this reason, Metallisation offer the ARC150 system with a 500A energiser, giving a balance between throughput, weight and control.

The design principle of the ARC150 has been to use the proven push/pull technology and air-cooled cables from the ARC140 system. We have maintained the long supplies capability and increased the throughput by over 40% compared to 350A systems. The pistol, energiser, drive unit and supplies pack have all been re-engineered to cater for the increased load and spray current. As with all Metallisation Arcspray systems, the ARC150 is designed to run at 100% duty cycle wherever it is used in the world.

The new ARC150 pistol has easily changeable V-rollers for positive wire feed at the higher throughput rates. The contacts and terminals are also enlarged and designed to cater for the higher spray current. The contact tube arrangement is a new design, utilising tubes with larger contact areas and replaceable contact tips. The tips are easy to change and are made from a specialist, hard wearing material which, along with the general design, aids to dissipate heat build-up. The cooler running front end with improved airflow offers finer coatings and optimised reliability when spraying at higher current.

The push/pull drive system continues to use our patented 'Synchrodrive' principle. A new, larger capacity sealed motor, pusher unit and flexible drive allows reliable wire feed up to a length of 20m. This enables great on-site flexibility to move around the work-site and apply coatings efficiently.

The S500-CL energiser features sealed electronics for reliable operation in the harshest of spray environments. All new digital gauges offer both scale and numeric displays. They have high contrast and are easily visible in light or dark conditions even through shaded visors. The energiser has closed loop current control that allows the operator to set a chosen spray current before starting to spray. The system also protects itself from spraying over 500A, regardless of the operator input. The energiser is PLC controlled with a robust, industry standard PLC unit, dramatically reducing the electrical components and increasing reliability.

The system is intended for traditional, high throughput corrosion protection applications spraying 2.3/2.5mm zinc, aluminium or their alloys like Zn/Al 85/15. There is a growing requirement in the industry for high temperature alloys to be sprayed too such as Inconel 625 or Hastelloy C276. To enable applicators to use the ARC150 system for these applications, a 1.6mm conversion kit is offered.

The ARC150/S500-CL system has undergone a rigorous design, engineering and testing program to bring you a high quality, high capacity but flexible system that will aid you to maximise production, efficiency and productivity in your thermal spray operations.

Safety: The equipment quoted will produce levels of noise, ultra violet light and dust that will require safety measures to be taken by those using the equipment. It may use pressurised gases. Careful consideration should also be given to the positioning of this equipment. It is the responsibility of the user to ensure that all appropriate measures are taken to ensure safe operation in accordance with local requirements. Metallisation will be pleased to advise as appropriate.

BENEFITS

GENERAL BENEFITS

- ✦ 500A spray capacity – increases productivity for large areas by over 40% but retains flexibility for spraying smaller and more complex structures.
- ✦ New contact tube and tip design gives finer coating finish and optimise reliability due to better heat dissipation at high current.
- ✦ Fine coating finish minimise post-processing when fine paint finishes required.
- ✦ Push/Pull system for a more stable arc ensuring quality coatings with consistent operation.
- ✦ Patented Flexible Drive system (Synchronised) with new, larger core for added strength under greater duty.
- ✦ 10 and 20 metre supplies packages from the wire to the pistol for spraying accessibility.
- ✦ New, higher powered, sealed / lubed for life inverter drive gear-motor.
- ✦ New, heavy duty push drive unit with independent, quantifiable tension adjustment.
- ✦ Air-cooled cables reduce pistol supply weight and operator fatigue and give good manoeuvrability
- ✦ Suitable for 2.3mm and 2.5mm Anti-corrosion (zinc, aluminium and their alloys) plus 1.6mm steels and high temperature alloys.
- ✦ V-shaped feed rollers are easy to change and are reversible for longer life from a single roller.
- ✦ Easy to maintain, less than 2 minutes to change contact tips that do not require adjustment.
- ✦ Spray voltage measured at the pistol for improved diagnostics and setup.
- ✦ Choice of coating textures
- ✦ When wire drive is energiser mounted, the drive unit can rotate through 180° to follow the operator whilst spraying
- ✦ Power extension trolley with several length options designed to allow the energiser to be sited away from the spray job.
- ✦ Quick release power, air and control couplings allow quick assembly / disassembly of package

S500-CL ENERGISER

- ✦ Closed loop current control - easy setup / reliable spray rate / over-current protection
- ✦ Easy setup – set the spray current before starting to spray.
- ✦ New, IP65 rated digital displays showing scale and numerical values.
- ✦ PLC control for improved reliability and ease of maintenance / fault finding with program supplied on an EPROM in case the PLC needs reprogramming
- ✦ 500Amp continuous operation at 100% duty cycle
- ✦ Easy access energiser panels & external fuse bank for reduced Mean Time to Repair (MTTR)
- ✦ Large 'Site Capable' wheels and rigid handle offers excellent portability on site and in workshop
- ✦ Sealed electrical control circuit - reduces dust ingress for added reliability
- ✦ Optional remote interface kit to enable remote operation and inclusion in a remote e-stop circuit.

ARC150 PISTOL

Part No.	Description
ARC150-CG23	Arcspray150 Pistol for 2.3mm wires
ARC150-CG25	Arcspray150 Pistol for 2.5mm wires
ARC150-CK-16	ARC150 Conversion Kit for 1.6mm wires



The Pistol has been designed to give consistent throughputs with high coating quality at 500A. It is a lightweight, heavy-duty unit with robust but compact construction.

TECHNICAL OVERVIEW

- ✦ Based on the proven ARC140 pistol design concept but with many enhancements to cater for the higher current rating and coating requirements from a 500A system.
- ✦ Heavy duty terminals, clamp pads and contact tubes/tips suitable for 500A
- ✦ New pushbutton design for easy operation and maintenance
- ✦ 2.3 and 2.5mm wire. Optional 1.6mm conversion kit for steels and high temperature alloys
- ✦ Profiled drive rollers suitable for 2.3/2.5mm wires. Rollers have 2 grooves and can be reversed for long life operation.
- ✦ New, longer contact tube and tip arrangement – improved coating quality and reliability due to optimised heat dissipation.
- ✦ Contact tips accessible and easily changed without dis-assembling the spray head.
- ✦ Ceramic nozzle replaced with air concentrator for optimum coating finish.
- ✦ Weight optimisation within various areas of the pistol
- ✦ Spray voltage measured at the pistol for improved reliability and diagnostics with long supplies packs.
- ✦ The wire drive unit utilises intermeshed hardened steel wormshaft and bronze wormwheels, being driven by a lightweight, flexible drive.
- ✦ Lightweight air-cooled conductor cables are fitted; which reduces the operator supported weight and further improves the overall balance of the Pistol.
- ✦ Closed arc for improved spray conditions and efficiency.



TECHNICAL DATA

Description	Characteristics
Maximum Current	500 Amps
Weight	2.1 Kgs
Weight – at a held height of 1.2 M	5.1 Kgs – inc Cables and Hoses
Width (with cables)	102mm
Length	275mm
Height	240mm

TYPICAL PERFORMANCE FIGURES FOR THE ARC150 PISTOL

Material	Wire Diameter	Throughput (kg/hr @ 500A)	Coverage m ² /kg/100μ
Metallisation Wire 01E Aluminium	2.3mm	12	2.88
Metallisation Wire 02E Zinc	2.3mm	51	0.82
Metallisation Wire 21E Zinc/Aluminium 85/15	2.3mm	44	1.00
Metallisation Wire 28E Arctec	2.3mm	12	3.85
Metallisation Wire 72E Inconel 625	1.6mm	13.6(@300A)	1.02

Throughput is assumed to be independent of wire diameter.

All data provided is an approximation and is offered as guidance only as performance can vary depending on application and parameters.

TOOLKIT

Appropriate hand tools are supplied with the Arcspray system along with an operating manual and pistol case



SUPPLIES PACKAGE

Part No.	Description
PISTOL SUPPLIES PACKS (between energiser/trolley and pistol)	
SUP150-10M	Arcspray150, 10m supplies package for electric drive, S500
SUP150-20M	Arcspray150, 20m supplies package for electric drive, S500
EXTENSION SUPPLIES PACKS (between energiser and trolley)	
SUP150-10EX	10m Supplies pack for power extension trolley (ARC150-PET)
SUP150-20EX	20m Supplies pack for power extension trolley (ARC150-PET)
SUP150-30EX	30m Supplies pack for power extension trolley (ARC150-PET)
SUP150-40EX	40m Supplies pack for power extension trolley (ARC150-PET)*

* only to be used with 10m pistol supplies pack

ENERGISER/TROLLEY TO PISTOL SUPPLIES PACKAGE INCLUDES



Power, Air and
Control Cables



Flexible
Drive Cable



Wire Conduits

TECHNICAL OVERVIEW

- 10/20 metre supplies packages for integration to S500 Energiser.
- New, heavy duty flexible drive for robust power transfer but with lightweight spring for optimised weight.
- Steel reinforced conduits for extended service life.
- Lightweight air-cooled conductor cables reduce the operator supported weight & fatigue.
- New 'torpedo' shaped manifold design for higher current and reliability in harsh spray environments.
- Robust, hard wearing supplies pack cover.
- Power cables fitted with twist and lock connectors into the energiser. Air hoses fitted with quick release fittings into the energiser.
- 7144 PTFE tubing is supplied when dispensing from drums to go between the drum dispensing cone and the wire drive unit.

EXTENSION SUPPLIES INCLUDES



Power cables, air hose and control cable

TECHNICAL OVERVIEW

- Lengths and configurations as shown in the tables on pages 3 and 8.
- Supplied with all fittings appropriate to connect to S500 Energiser and Power Extension Trolley
- Quick release power, air and control couplings allow quick assembly / disassembly of package
- Robust supplies pack covers only supplied on the 10 and 20m standard extensions due to packaging heavy power cables in one bundle.

ENERGISER

Part No.	Description
S500-PLC	S500 (ARC150) Energizer with closed loop current control
S500FV-PLC	S500 (ARC150) Energizer with closed loop current control (200-220v Fixed Voltage)
PLC-E/STOP-K	Remote operation E-Stop kit for PLC energisers



This Energiser has been specifically designed for use in anti-corrosion arc spraying applications

TECHNICAL OVERVIEW

- ✦ Closed Loop Current Control – easy setup / reliable spray rate / over-current protection
- ✦ PLC control for improved reliability and ease of maintenance / fault finding
- ✦ 500 Amp continuous operation (100% duty cycle)
- ✦ Specifically designed to suit only Arc spraying.
- ✦ Large 'Site Capable' wheels and rigid handle offers portability on site and in workshop
- ✦ New digital panel meters
 - Easy to read with scale and numerical display
 - Higher accuracy than traditional gauges
 - Warning alert status (ammeter turns red if overcurrent)
 - Wide viewing angle with high contrast for ease of viewing inside or out
 - IP65 rated and Gorilla glass screens
- ✦ Sealed electrical control circuit - reduces dust ingress for added reliability
- ✦ Easy access energiser panels & external fuse bank for reduced Mean Time to Repair (MTTR). Shake-proof terminals minimise risk of loose control connections
- ✦ Switched output voltage control
- ✦ 220V/380V/460V input supply options available (hard wired)
- ✦ High performance diodes/rectifier – longer life and higher operating parameters
- ✦ Key switch to select extension spraying mode which limits current to 350A when using a deflected arc extension
- ✦ Remote operation E-stop kit allows energiser to be started/stopped remotely via a pendant or interfaced into an automation E-stop circuit. It comes with a plug that can be wired as required.

S500 ENERGISER SPECIFICATION

Description	Characteristics
Input Power Requirements	380/415/460V 50-60Hz 3 Phase
Optional Input Power	220V 50-60Hz 3 Phase
Fusing Required	37A @ 460 Vac 40A @ 415 Vac 44A @ 380 Vac 76A @ 220 Vac 84A @ 200 Vac
Max Power Consumption	29 KVA (at 46VDC/500A)
Typical Power Consumption	16 KVA (Zinc 26Vdc/500A output) 22 KVA (Aluminium 35Vdc/500A output)
Duty	0-500 Amps @ 100% Duty Cycle
Output Voltage	0-49Vdc (nominal) Switched High/ Low & 1 – 5
Air Requirements	1.5m ³ /min @ 5bar (53cfm @ 72.5psi)
Weight	292 Kgs
Dimensions (W x L x H)	670mm x 900mm x 875mm

WIRE DRIVE AND DISPENSE

Part No.	Description
ARC150-DUAEV-MIG	ARC150 Drive unit for MIG Dispensing
ARC150-DUAEV-DRUM	ARC150 Drive unit for Drum/Cones Dispensing
21252	Wire Dispensing Cone with Adjustable Reeling Pulley and Frame
6274/5	½" Clamp Pads for PTFE Tubing
7144	PTFE Wire Conduits (Supplied by the meter)

DRIVE UNITS



ARC150-DUAEV-MIG



ARC150-DUAEV-DRUM

TECHNICAL OVERVIEW

- Heavy duty (0.55kW) electric inverter drive motor for smooth wire control at higher duty.
- New drive unit with independently adjustable wire tension for easy setup.
- Profiled drive rollers suitable for 2.3/2.5mm wires. Rollers have 2 grooves and can be reversed for long life operation. Easy to changeover for cleaning/replacement.
- Push/pull mechanism positively drives the wire at the dispenser and also at the pistol via the heavy duty flexible drive, ensuring constant speed at the drive unit and pistol
- Allows complete use of all the wire (unlike push only systems)



The Metallisation wire dispensing cone offers the ability to conveniently dispense anti-corrosion wires from production packs (drums). The wire is neatly guided to a dispense point, then over the pulley to give a free passage of wire from the drum to pistol. Benefits include:

- Suitable for dispensing Zinc, Aluminium and Zinc/Aluminium wire
- Specifically designed to suit Arcspraying with the each drum being individually insulated from each other.
- Variable position clamp assembly allows the clamp to be rotated to give the smoothest wire transfer path from the drum to the pistol.
- Drums available in 250 Kg for Zinc, 200kg for Zinc/Aluminium and 60Kg for Aluminium.

NON POWERED EXTENSION TROLLEY

Part No.	Description
2006-NPET	Non Powered Extension Trolley

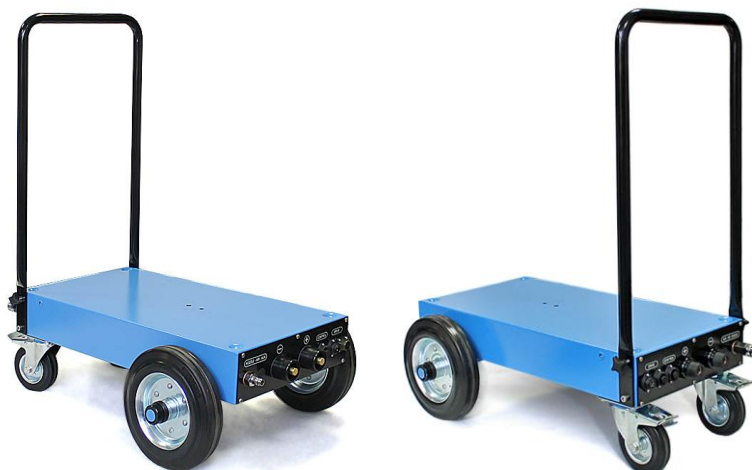


TECHNICAL OVERVIEW

- Allows movement of the drive unit and wire dispense around the site independently of the energiser (maximum 3.5m from the energiser unless a drive motor/inverter extension lead is used)
- Braked castors

POWER EXTENSION TROLLEY

Part No.	Description
ARC150-PET	ARC150 powered extension trolley for ARC150 systems



TECHNICAL OVERVIEW

- As the NPET trolley but designed to allow the energiser to be sited further away from the spray job, offering greater access to the work area and protecting the energiser from the harsh site environment
- Quick release power, air and control couplings to allow quick assembly / disassembly of the spraying system

POWER DRUM TROLLEY

Part No.	Description
ARC150-PDT	Powered Drum Trolley for ARC150 Systems



TECHNICAL OVERVIEW

- Designed to allow the energiser to be sited further away from the spray job, offering greater access to the work area and protecting the energiser from the harsh site environment
- Quick release power, air and control couplings to allow quick assembly / disassembly of the spraying system
- Enables drums to be easily moved around the work-site.

TYPICAL CONFIGURATION

Most commonly used in where it is an advantage to spray from drums but keep the energiser remotely located, e.g. wind towers where the energiser can be kept outside the spray booth and the drums and drive unit can be taken directly to the end of the tower. This enables the full length (up to 20m) of supplies to be used to spray down the tower internals.



Energiser



Extension Supplies



Power drum trolley



Supplies from wire drive to pistol



Pistol

ARC140-PDT image shown

OPTIONAL ACCESSORIES

ARC EXTENSIONS

Part No.	Description
ARC150-EXT-150-23	Arcspray 150 Extension Deflector 2.3mm Wires 150mm Long
ARC150-EXT-500-23	Arcspray 150 Extension Deflector 2.3mm Wires 500mm Long

1.6mm, 2.3mm and 2.5mm versions of the above are available for zinc, zinc/aluminium and aluminium wires (p/n as above with -16, -23 or -25 suffix). Engineering wires can only be sprayed with 1.6mm extension.

TECHNICAL OVERVIEW

- ✔ Suitable for internal bores (min Diameter 75mm) or recesses.
- ✔ Variable deflected spray from 0 to 75 Degrees



Description.	Characteristic
Maximum Current	350 Amps
Compressed Air	0.6m³ / min @ 4.5 Bar

HOSES FOR EXTENSIONS / ARCBEAMS

Part No.	Description
21601/11	3/8" QR Air Hose x 11Mtr
21601/21	3/8" QR Air Hose x 21Mtr

TECHNICAL OVERVIEW

- ✔ Air hoses with quick release connections to connect the accessories to the auxiliary air supply on the energiser.
- ✔ Lengths supplied to suit our standard 10m and 20m supplies packs.

REMOTE OPERATION AND PENDANTS

Part No.	Description
PLC-REMOTE	Remote operation plug & cable for PLC energisers (E-Stop kit reqd if not fitted.)
PLC-REMOTE-K	Remote operation plug & cable for PLC energisers + E-Stop kit
PLC-PENDANT	Remote operation pendant for PLC energisers (E-Stop kit reqd if not fitted)
PLC-PENDANT-K	Remote operation pendant for PLC energisers + E-Stop kit



Also comes with 10m control cable to connect to energiser (can be longer on request)

TECHNICAL OVERVIEW

- ✦ The 'REMOTE' items consist of a 10m cable and pre-wired plug to connect to the energiser. The other end is free to allow connection to customer automation/robot etc.
- ✦ The 'PENDANT' consist of a remote operation pendant to start/stop the system and also have an E-stop button for safe operation
- ✦ Allows remote operation of the system for when pistol is mounted to a robot or manipulator.
- ✦ Connects into energiser in a dedicated socket on the rear of the energiser. If remote connection is made, the pistol cannot be operated from the pistol buttons and there is no need to remove the pistol control cable from the front of the energiser.

PACKAGED SYSTEMS

The most commonly supplied systems are offered as a package with one part number. Details of the part numbers and systems are shown below.

Part No.	Description
ARC150-2310M	ARC150 System, 2.3mm, 10m supplies, MIG dispense
ARC150-2320M	ARC150 System, 2.3mm, 20m supplies, MIG dispense
ARC150-2310D	ARC150 System, 2.3mm, 10m supplies, drum dispense
ARC150-2320D	ARC150 System, 2.3mm, 20m supplies, drum dispense
ARC150-2510M	ARC150 System, 2.5mm, 10m supplies, MIG dispense
ARC150-2520M	ARC150 System, 2.5mm, 20m supplies, MIG dispense
ARC150-2510D	ARC150 System, 2.5mm, 10m supplies, drum dispense
ARC150-2520D	ARC150 System, 2.5mm, 20m supplies, drum dispense

MIG SYSTEM CONSIST OF:

- 1 x Pistol (wire size as indicated)
- 1 x Supplies package (length as indicated)
- 1 x S500-PLC energiser
- 1 x ARC150-DUAEV-MIG dispenser and drive unit
- 1 x Toolkit

DRUM SYSTEM CONSIST OF:

- 1 x Pistol (wire size as indicated)
- 1 x Supplies package (length as indicated)
- 1 x S500-PLC energiser
- 1 x ARC150-DUAEV-DRUM dispenser and drive unit
- 2 x 21252 wire dispensing cones
- 2 x 6274/5 clamp blocks
- 2 x 2m lengths of 7144 PTFE conduit
- 1 x Toolkit



NOTES

USEFUL INFORMATION

MATERIAL USAGE

The table below shows approximate material throughput and coverage assuming a spray rate of 500A with 2.3mm diameter material.

MATERIAL	THROUGHPUT KG/HR @ 500 Amps	COVERAGE (KG/M ² /100μ)
Metallisation Wire 02E Zinc	51	1.22
Metallisation Wire 01E/17E/25E Aluminium & Alloys	12	0.35
Metallisation Wire 21E Zinc/Aluminium 85/15	44	1.00

TIME TO SPRAY

The table below shows the approximate time it would take to spray a given area with 100 μm coating thickness.

MATERIAL	AREA (m ² @100μ)	TIME
Metallisation Wire 02E Zinc	1	1.6 mins
	10	16 mins
	100	2 hrs 40 mins
Metallisation Wire 01E/17E/25E Aluminium & Alloys	1	2 mins
	10	20 mins
	100	3 hrs 20 mins
Metallisation Wire 021E Zinc/Aluminium 85/15	1	1.6 mins
	10	16 mins
	100	2 hrs 40 mins

For thicker or thinner coatings, the spraying time varies in proportion to the thickness. For example, it takes approximately 2 minutes to spray a 1m² area of zinc at 100μ . It would take 4 minutes to spray the same area at 200μ.

The given times are approximate 'gun-on' spray times and do not make any allowance for stoppages, wire changes, part manipulation etc.

Note: The information given above is intended for guidance purpose only. Material usage and time taken will depend on a number of factors, these including the quality of the prepared substrate and the shape and size of the job.

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