



Natgraph

Perfecting drying solutions



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About Us

Natgraph is a manufacturer of drying and curing systems based in Nottinghamshire, England.

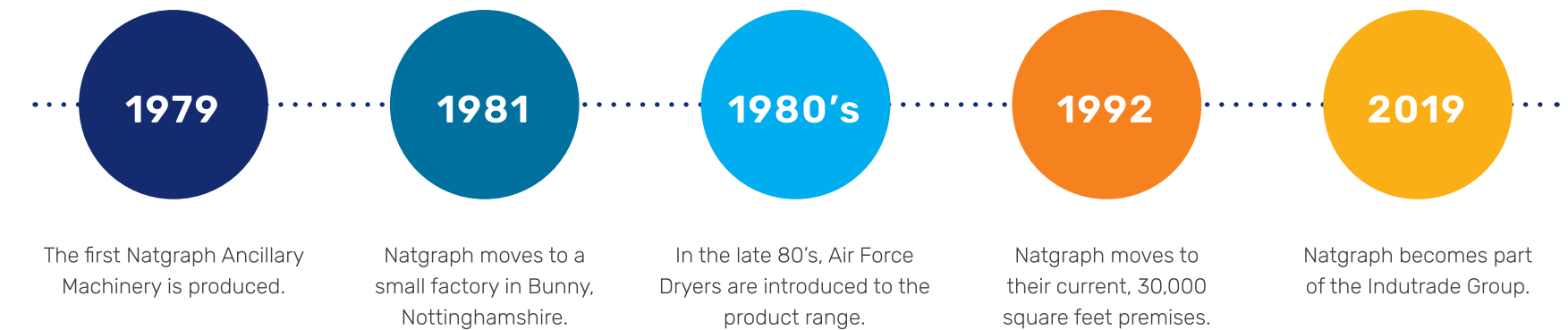
Our drying and curing systems are forged from sheet steel and are transformed into precise, controllable, and energy-efficient electro-mechanical drying machinery in our vertically integrated factory.

Natgraph takes special care and ownership of every aspect of the design and manufacturing process to ensure our machines are of the highest quality and reliability.

Our markets often require tailored, high-performance solutions and so being vertically integrated enables us to be agile, responsive, and innovative to create bespoke projects, this is one of the reasons that we are the leading drying and curing manufacturer globally.



Our Timeline

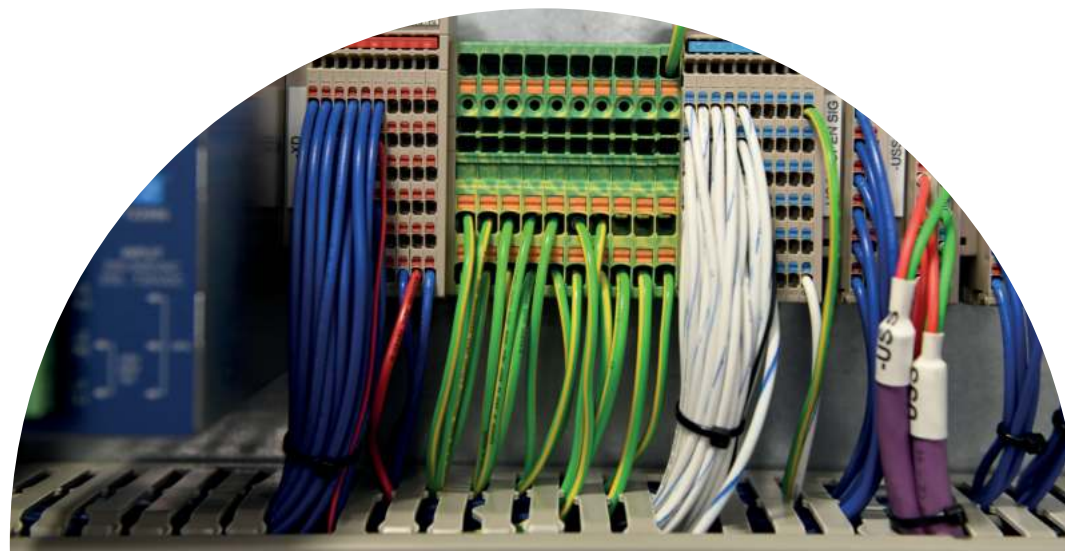


Our Prestige

We are proud to conform to the following ISO accreditations to ensure our products and factory are compliant with the stringent environmental, safety and quality standards.

ISO 45001 Occupational health & safety systems
ISO 14001 Environmental management
ISO 9001 Quality management systems

We also hold the **Queen's Award** for **Enterprise: International Trade**



Our Distribution Network

Our long-established network of distribution partners is located across the globe, they have a wealth of industry knowledge and experience to suit your industry and application.



Applications



Medical



Reel-to-Reel



Automotive & FIM



Graphic Overlay
& Conductive



Credit &
Security Cards



Energy, Fuel Cells
& Renewable



Print Finishing
& Spot UV



Textile Transfer &
Tagless Labels



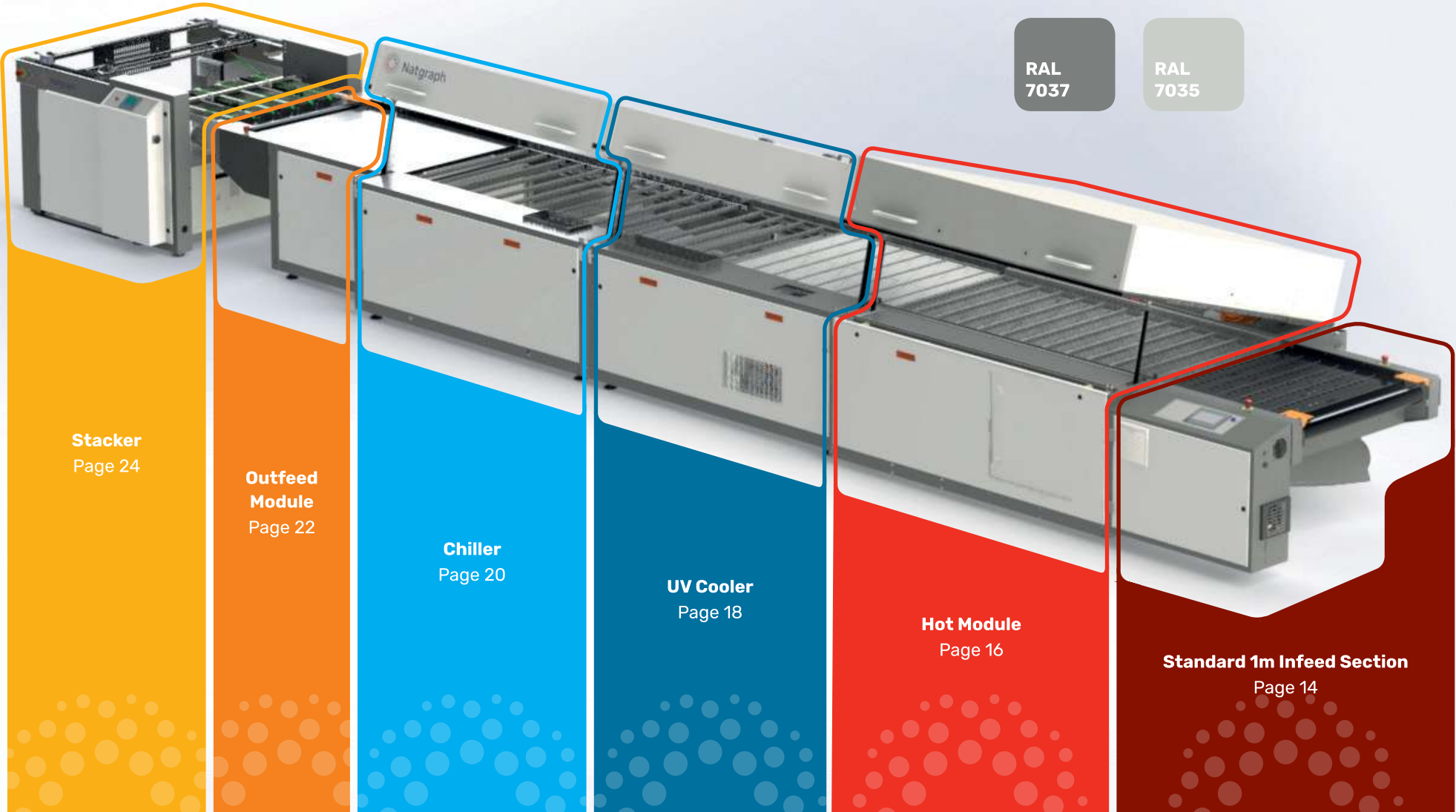
Architectural &
Functional Glass

Modules

Natgraph's Machinery is built in modular sections. The dryer below shows an overview of the different module types available for our Airforce Dryers.

Using a modular system ensures we offer the perfect drying and curing solutions for a wide range of applications

All modules are painted in RAL colours 7035 and 7037 in keeping with most other production line equipment colours. Custom colours are also available.



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Outfeed
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Standard 1m Infeed Section
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Control System

All modules are individually controllable from the operator panel (HMI) and the process settings can be saved and recalled using the recipe facility.

Data logging of the process variables as standard. The data can be extracted and archived for future reference externally.



Energy Saving Systems

Natgraph's Intelligent Energy Control System (IECS) aligns dryer energy consumption with process activity. If the press, for example, is in a standby or make ready condition the dryers will go into a low power hibernation mode awaiting a signal to instantaneously recommence.

Heat exchangers preheat the intake air from the exhaust air which minimises the energy required to bring the cool air up to temperature.



Heat exchanger

i4.0 Smart Control

- Energy monitoring system
- Live data capture V, A, kWh
- Remote monitoring for engineers
- All data available for export to external data collection point



The hours of operation for UV lamps are displayed when the UV Idle or IES Control is activated.

This gives a means of monitoring how much time has been spent with the dryer in full power operation and how much time there has been without substrate being processed.

Functionality

- Local online backup and restore of the project software through the PLC's Web Server
- Recipe date backup and restore via a USB key on the HMI
- Data from the process can be viewed/saved
- Locally monitor the PLC digital and analogue inputs/outputs using the 'Watch Tables' tab.
- Power monitoring and logging

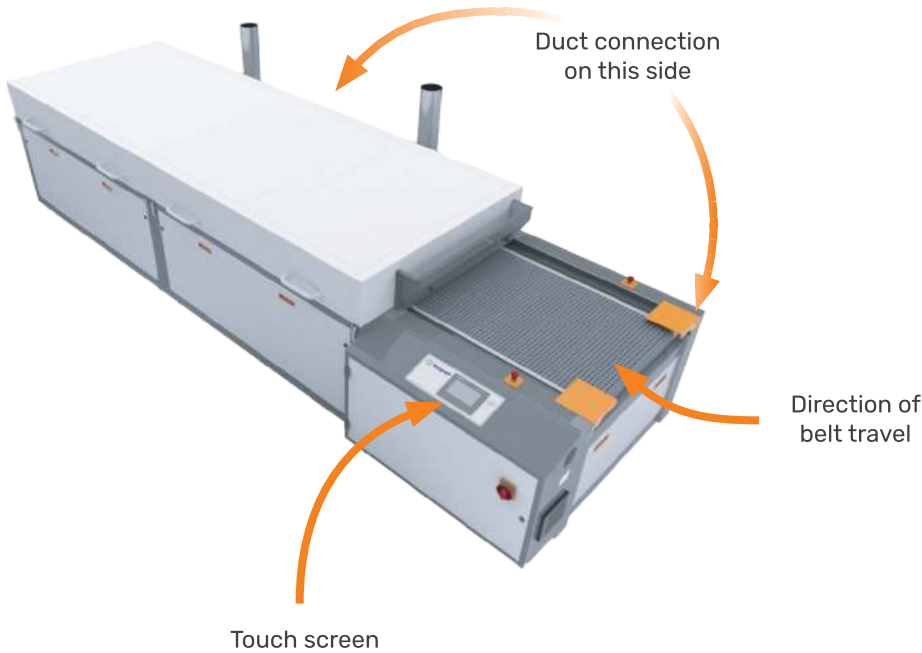
Data available for download via Ethernet connection

- Recipe name selected
- Set values (SV) for the recipe selected
- Actual values (AV)

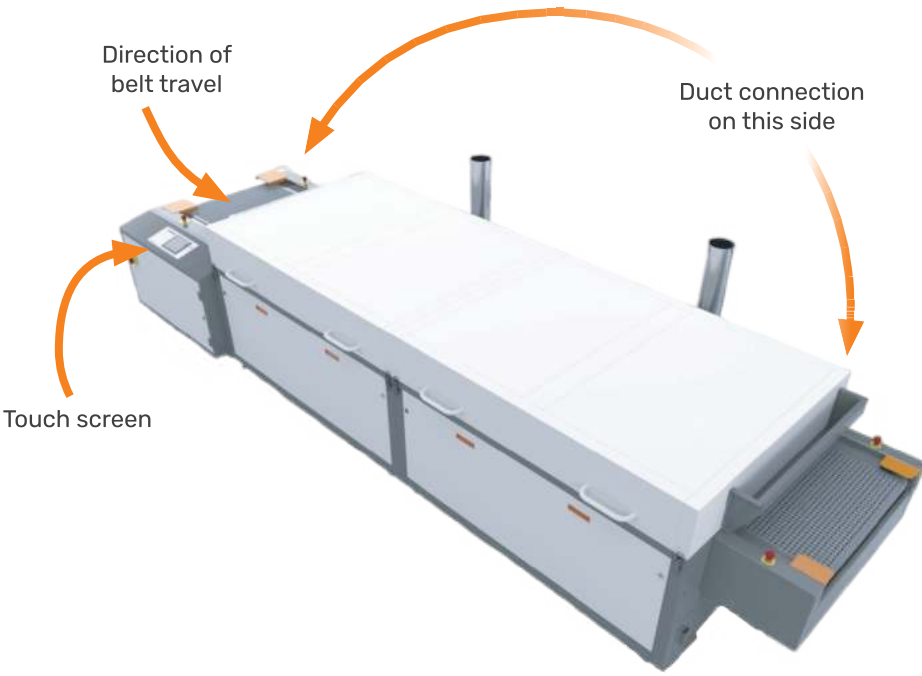
Dryer Orientation

Our dryers can be orientated in the following four ways to ensure the equipment is compatible with the rest of your production line.

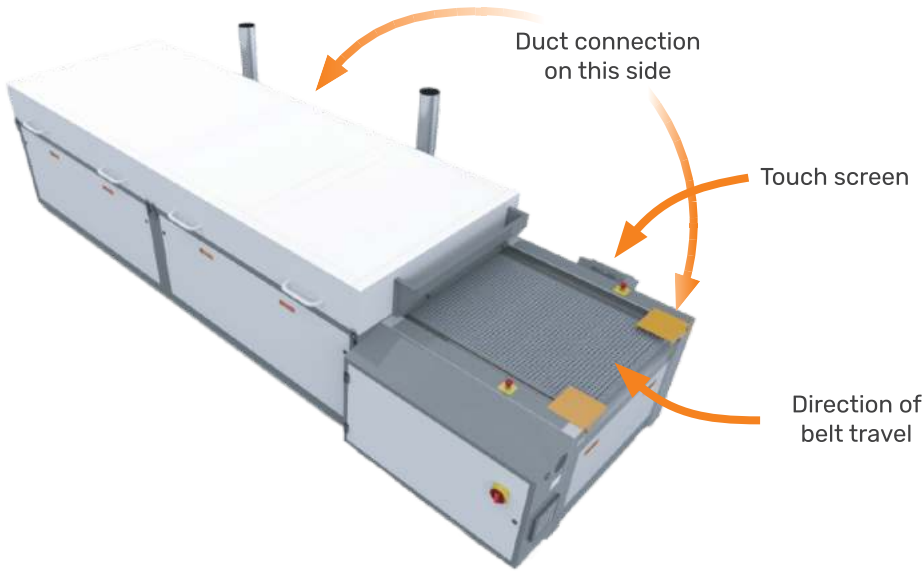
Alpha



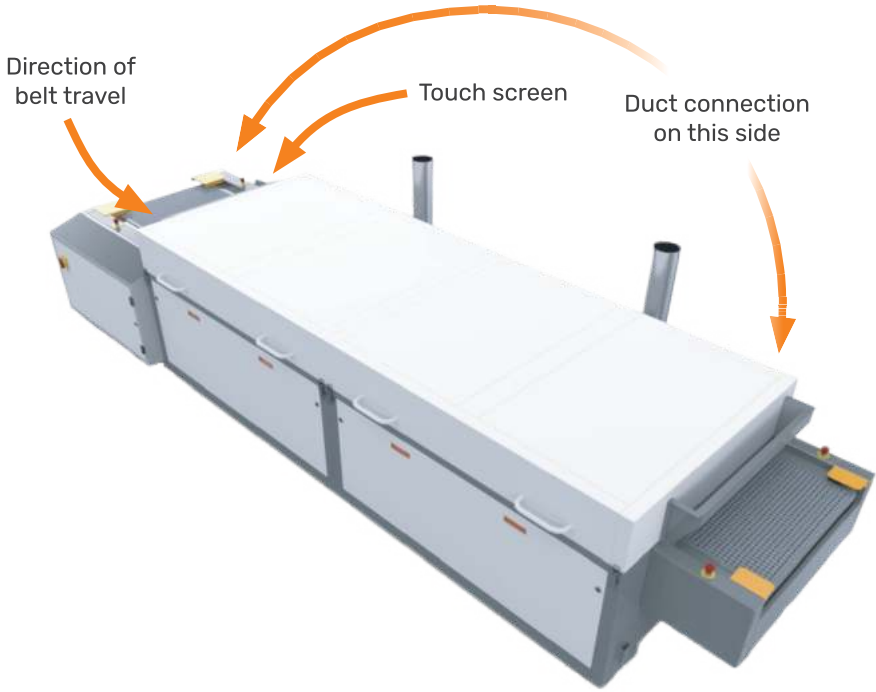
Beta



Gamma



Delta



Infeed Section

There are a variety of customisable Infeed Module options. All sections are modular and include a sheet hold down facility to stabilise material as it travels into the drying sections.

- Integrates with any printer
- Control system location
- IR/UV Bridge compatible
- Finger guards and emergency stop
- Closed loop speed control with encoder feedback
- Power transformer for 200V printers
- Conveyor belt tensioning system



Infeed Module



Sizes available:

0.5m	1m	1.5m
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**Other custom sizes are available*

Drop Down Infeed Module



Infeed Module with a pneumatically operated drop-down conveyor fitted with a vacuum hold-down system. The drop-down conveyor allows easy access to the print machine for set-up and cleaning.

Size available:

1.5m (1m retracted)

Options are:

Infeed Extension

Available in 1 or 2-metre lengths, these sections can be combined to allow a longer infeed section useful for IR bridge options, coating applications and hand-feeding from multiple print machines.

CCTV Monitoring System

A colour CCTV system can be fitted to all Natgraph dryers, this system includes a dedicated TV monitor above the infeed of the dryer which is mounted on a fully adjustable stand. The CCTV camera is post-mounted above the stacker. This allows the operator to see the stacker without leaving the printing machine, which is very important when operating long, high-speed, fully automatic printing lines.

Status Beacon

The colour of the beacon indicates the dryer conditions, for example, green indicates the dryer is ready, amber indicates standby mode, and red indicates that the dryer is not ready.

Automatic Tracking System

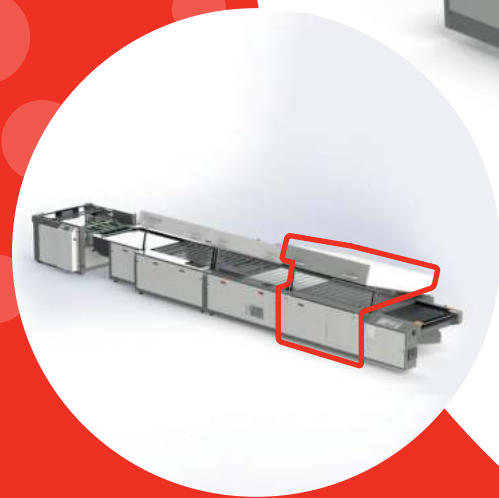
This system consists of 2 optical sensors mounted on adjustable brackets to detect sideways belt movement, controlling a pneumatically operated, full width, belt tensioning bar. This bar has a manually adjusted set point on one side and a pneumatically operated adjustment on the other. Mounted within the inlet section of the dryer, the belt position is continually monitored and automatically adjusted to ensure correct tracking of the belt within the settings of the sensors.

Heated Modules

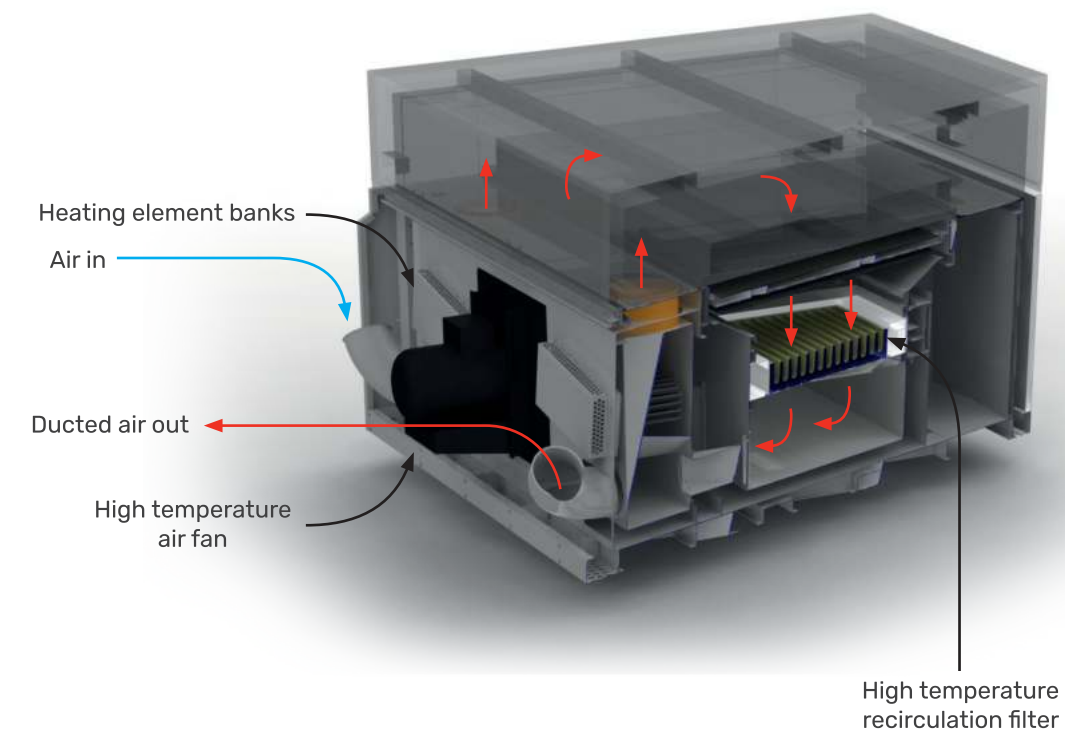


All Heated Modules are each 2m in length and can be combined to suit the drying cycle time required.

- High-performance fan systems
- Air recirculation to achieve efficient heating and a powerful vacuum hold down
- Exhaust levels controlled by manual or automatic dampers
- Outer insulation layer to ensure minimal thermal losses
- Quick response electrical heating elements
- Closed-loop temperature control using PID control
- Solid-state heating and IR load switching
- Airways are constructed of stainless and galvanised steel. Can be all stainless steel for more demanding applications
- Integral gas-filled lifting arms for ease of access for maintenance and cleaning
- Recirculation filters – G4, M6
- Heat exchangers option



Cut away section of a high temperature module:



Warm Air Module

85 degrees centigrade maximum temperature using high velocity for efficient drying of water and solvent-based inks or coatings.

Electrical heating and high-pressure air systems are optimised to give evenly distributed curing performance throughout the entire heating process.

Hot Air Module

130 / 200 / 260 / 300 degrees centigrade maximum temperature – higher temperatures on request.

Fully enclosed stainless steel airbox construction with a high-temperature fan. Variable speed to control the substrate and optimise the curing conditions inside the process area.

UV Cooling Modules



All UV Cooling Modules are each 2m in length. Natgraph's UV technology is acknowledged as the coolest running and most efficient available. This has been achieved with extensive knowledge of discharge lamp requirements for optimum performance.

- UV section can be fitted with 1 or 2 lamps
- Lamp types – Mercury, Iron, Gallium doped
- Intelligent electronic UV system – power saving up to 75%
- Standard outputs – 120 w/cm
- Optional high-power outputs 170 w/cm
- Fully focussed anodised aluminium reflectors for the highest UV impact
- Low-temperature operation utilising quartz IR filters
- Optional shutter system for web/reel-to-reel system integration

2m UV/Cooler *(Ambient)*

2m module with UV section followed by forced air cooling zone. Ducted cooling air intake for economical operation.

- 2-metre module with a UV section with an ambient forced air cooling zone
- Optional UV output monitoring and closed – loop control – for precise UV power output control

2m UV/Chiller *(Refrigerated)*

2m cooling module with recirculation air cooling. Air is refrigerated.

- Optional UV output monitoring and closed – loop control – for precise UV power output control
- Active cooling system using an external water chiller unit – integrated control
- Low substrate impact temperature and efficient post cure cooling
- Temperature monitoring
- Condensate water drain

1m UV

- 1-metre module with a UV section



LED UV Lamp

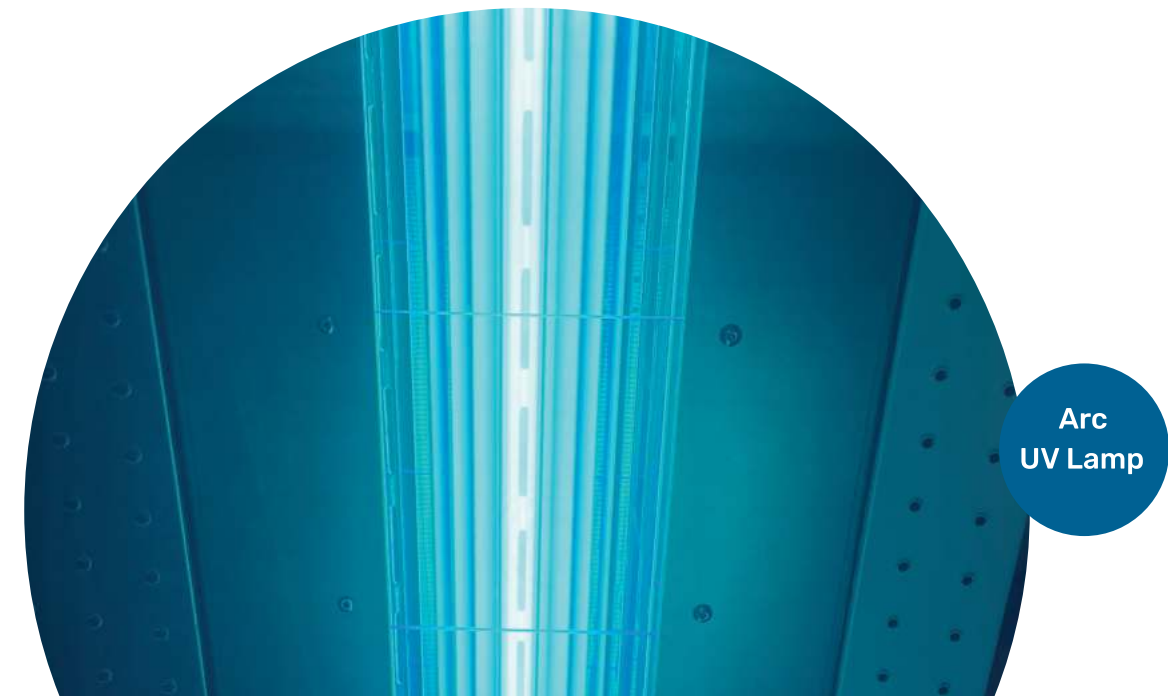
Retrofit LED curing systems to ensure your machine is future-proof.

LED curing systems are now offered in the following new Natgraph dryers with the following options:

- Wavelength of UV- 405/395/385 or 365 nm
- Power level – up to 24 w/cm using high-efficiency water-cooled LED COB (Chip on Board) system
- Can be specified in any new-build free-standing UV dryer/mini dryer/combination dryer
- Combination UV is also possible with 1 x LED, and 1 x Conventional UV lamp for maximum flexibility

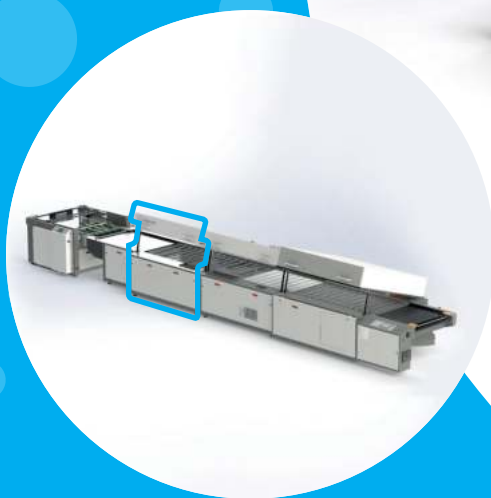
An LED curing system has benefits in certain scenarios...

- Energy-saving benefits as the LED head can be switched on and off quickly, with no cool-down time, no standby power operation is necessary
- No ozone produced by the UV production so lower airflow volumes required
- Lower substrate impact temperatures due to minimal IR generated by LED head
- Higher UV intensities are possible than with conventional mercury arc lamps
- No mercury content in the system eliminating the need for specialist recycling of lamps and reducing environmental impact
- Life of LED is much longer than mercury arc lamps
- The curing head has a much smaller footprint so limited space installations are possible



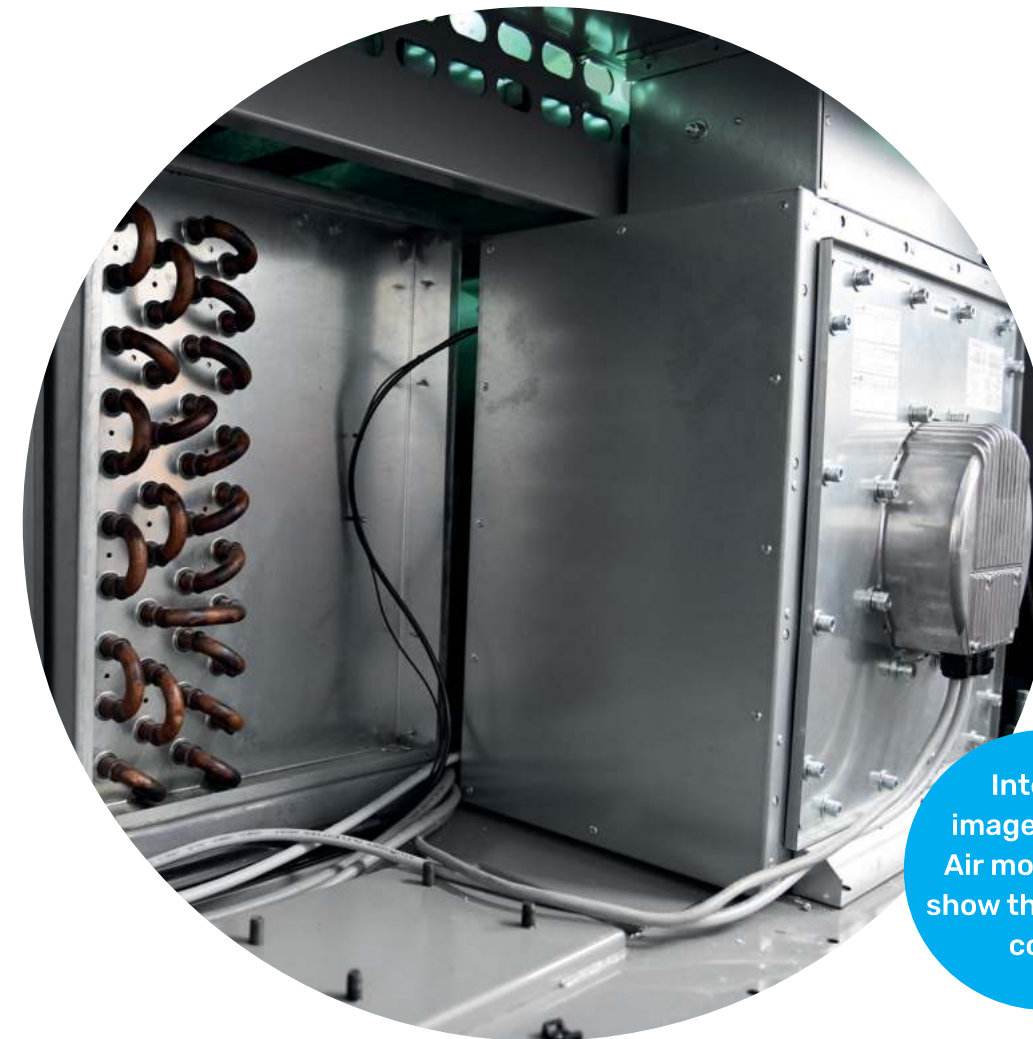
Arc UV Lamp

Cool Air Modules



All Cool Air Modules are each 2m in length, they can cool substrates with either cool ambient air or with refrigerated chilled air.

- 2-metre cold (ambient) air module with high-efficiency cool air delivery and extraction system.
- This system provides a powerful vacuum hold down facility under the conveyor belt within the module.
- The fully insulated raising hood is designed to provide an even air delivery across the entire conveyor belt area for consistent and repeatable results.
- The uniquely designed galvanised jet plates are easily removable.
- 2 integral gas-filled lifting arms are fitted to the dryer for ease of access for maintenance and cleaning.
- This module is fully sealed and is fitted with dedicated infeed and outfeed duct connection points.



Internal image of Cool Air modules to show the cooling coils.

2m Cooler (Ambient)

2m cooling module with ducted air intake and dedicated exhaust for heated air.

2m Chiller (Refrigerated)

2m cooling module with ducted air intake and dedicated exhaust for heated air.

- 2-metre cold (refrigerated) air module using a high-performance fan and high-efficiency air recirculation system.
- The module is fitted with a large internal cooling coil and recirculation filter
- Temperature set point and monitoring
- Condensate water drain
- Separate water chiller available

Outfeed Modules



Natgraphs outfeed section can also be customised to a required length. A combination of the below options or any purpose-designed and built outfeeds are available from Natgraph.

An outfeed is particularly useful when products are being manually offloaded to give the operator more room to do this. Outfeed Modules contain the conveyor belt's main drive motor, drive mechanism, automatic chain tensioning system, and drive roller.

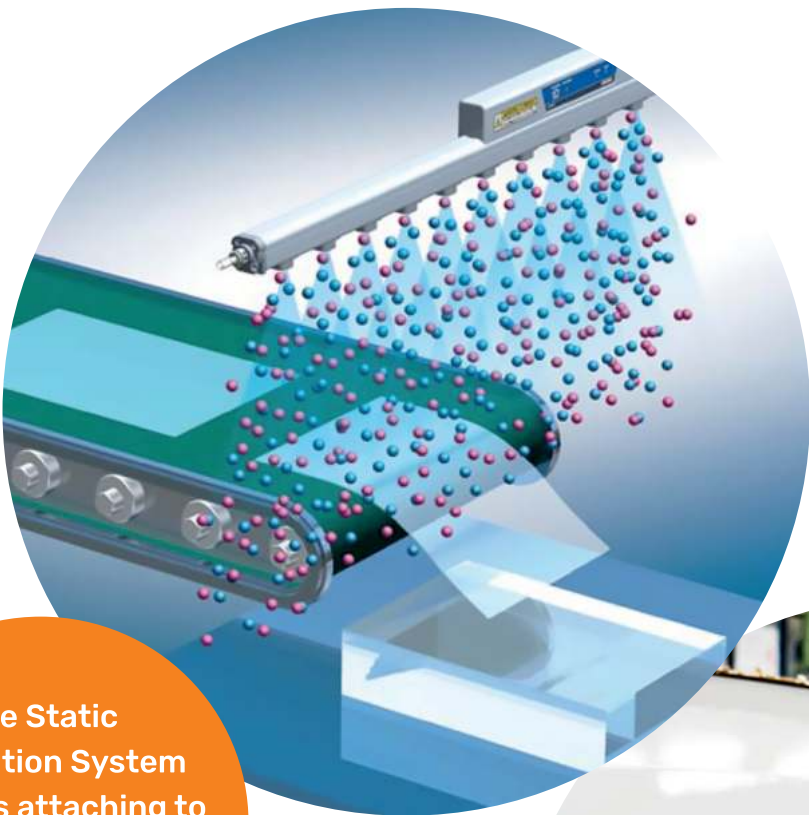
Extended Outfeed Module

Available with or without wing.

Sizes available:	
1m	2m

Outfeed Wing

Sizes available:		
0.3m	0.5m	1m



The Static Elimination System prevents attaching to conveyor and dispersion of finished goods.



Options are:

Static Elimination System			
A single high efficiency ioniser shockless bar in an optimum location on a fully adjustable bracket. Automatic operation integrated into the dryer control system.			
Belt Speed Options (Standard)			
0.2-2 m/min	1-10 m/min	2-20 m/min	3-65 m/min

Ancillary Equipment



Stacker

The Natgraph Automatic Sheet Stackers are completely self-contained with their own drive motor, air blower and hoist.

Available in a variety of sizes, this unit is extremely efficient and versatile with special versions able to accept up to 8,000 sheet per hour. The hoist is chain operated with a reinforced steel base plate with a ramp front.

Fully integrated control to the dryer – remote start/stop, speed following, alarm reporting and stack full warning to control stop the press automatically.

Options are:

CCTV Monitoring System

A colour CCTV system can be fitted to all Natgraph dryers, this system includes a free-standing, post-mounted camera above the stacker and a dedicated TV monitor mounted on a fully adjustable stand above the infeed of the dryer. This allows the operator to see the stacker without leaving the printing machine, which is very important when operating long, high speed, fully automatic printing lines.

Continuous Operation

This feature allows a large or small pile of the printed substrate to be removed from the stacker without interrupting the printing cycle, therefore allowing continuous operation. This consists of a pneumatically operated support 'gate' that provides temporary sheet support to approximately 60mm of substrate height whilst the stack below is unloaded.



Collection Tray

The Natgraph Sheet Collection Trays have been designed to operate with all the Natgraph dryer sizes, as well as other makes of the dryer.

They are of steel construction, with a heavy-duty framework and fabricated sheet tray. The sheet tray has a moveable sheet stop to accept different paper sizes whilst the stand is adjustable both in height and angle. The tray can also be tilted to either side so the substrate will fall that way.

Options are:

Air Blower

An optional air blower tube can be fitted to aid in the delivery of larger or heavier substrates.

Vibrating Tray

A vibrating version is available which will 'jog' the substrate into a neat stack.

Conveyor systems

- PTFE coated fibreglass – 4mm or 2mm
- Solid weave for substrates prone to marking
- Roller conveyor – glass/wood
- Stainless steel ladder – automotive/hydrogen processing
- Other conveyor systems are available on request



Vertical integration ensures we can produce bespoke equipment such as this reel-to-reel web dryer which uses Natgraph designed air floatation for minimal contact with the substrate.



Reel-to-Reel Systems

Built on decades of success supporting the most demanding applications, Natgraph bring exceptional drying capabilities and significant new levels of energy efficiency to the Reel-to-Reel (R2R) coating and printing sector through excellent control and product design which reduces energy consumption.

Jet Pack HP

Main Heating Module



Features and Benefits

- Main recirculation fan controlled by Variable Control Drives
- Dedicated exhaust fan controlled by Variable Control Drives
- Exhaust pressure monitoring to optimise performance
- Over temperature capillary thermostat
- Heat exchanger to recover energy from the exhaust air and used to preheat make up air. Estimated 6-8kW energy savings
- Power connection onto local isolator
- Safety connection from external master safety relay (Natgraph slave)
- All wires will be marked
- Fast Cool down feature
- Air speed adjustable between 60 & 100%
- Mild steel construction finished in **RAL colours 7035 & 7037**

Control

- Stand alone PLC for integration to the master PLC/**GUI
- Local independent ***HMI control of drying units

Hot Air Delivery Hood



Features and Benefits

- Hot Air Delivery Hoods will be mounted on customer supplied frame. Customer will also supply and install idler and chiller rolls
- Two metres of high velocity air with variable control by Variable Control Drive - 130 degrees centigrade max temperature
- Exhaust path optimised to recirculate the process air efficiently
- Five metres of flexible high temperature hose for infeed and exhaust air

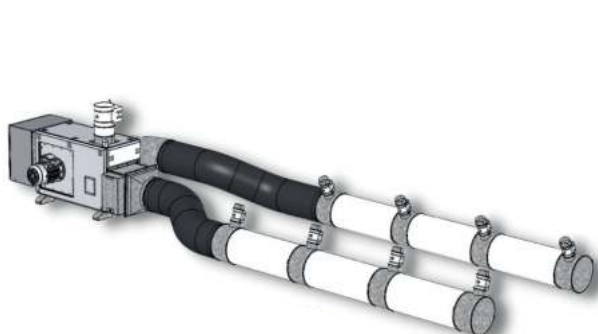
Options:
Infrared
Infrared Pyrometer
Intake Filter

Web widths available (mm):				
350	430	510	650	760

* Please enquire if you require a custom web width

Jet Pack E

Main Heating Module



Features and Benefits

- Free standing construction
- Contains the main recirculation fan controlled by Variable Control Drives
- Central ducting system to distribute to local heads - 1 metre sections
- Exhaust pressure monitoring to optimise performance
- Over temperature capillary thermostat
- Power connection onto local isolator

Control

- Stand alone PLC for integration to the master PLC/**GUI
- Local independent ***HMI control of drying units

Hot Air Delivery Hood



Features and Benefits

- Hot Air Delivery Hoods will be mounted on supplied frame
- High velocity air with variable control by Variable Control
- Drive - 130 degrees centigrade max temperature
- Exhaust path optimised to recirculate the process air efficiently
- Two metres of flexible high temperature hose for heating and exhaust

Options:
Infrared

Web widths available (mm):				
350	430	510	650	760

* Please enquire if you require a custom web width

IR Pack

IR Delivery Hood



Features and Benefits

- Dryer hoods will be mounted on customer supplied frame
- Six medium wave twin emitter fast response infra-red lamps
- Fance mounted to IR hoods to direct air from the lamps to the web
- Infra-red controlled with variable power 0-10V controlled by External Machine

Web widths available (mm):				
350	430	510	650	760

* Please enquire if you require a custom web width

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