

passionate about plasma®

Activation | Cleaning | Coating | Etching

Plasma Surface Treatment

Nebula

Advanced Plasma Surface Treatment Systems



Nebula Advanced Plasma Systems

Nebula Plasma Surface Treatment Systems feature large format vacuum chambers along with many advanced features and the reliability of recipe driven PLC control for unattended operation.

Giving total control to the user, Nebula systems are versatile tools. With robust and repeatable processes ideal for industrial processing, along with bespoke customisation ideal for research and development of unique plasma driven process.

The **Nebula** range has been designed around our core technologies in plasma surface treatment and plasma process development. With chamber volumes ranging from 30L to 150L, each system may be configured with multiple parts trays and for either horizontal or vertical mounting arrangements. Additionally, a high-capacity rotary drum mechanism can be chosen for batch treatment of large numbers of small parts.

SUITABLE FOR

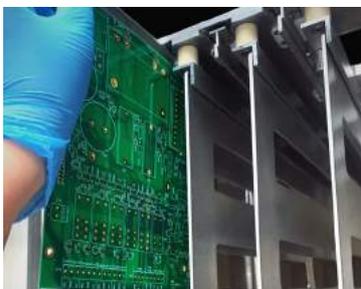
- Cleaning
- Adhesion Improvement
- Surface Activation
- Hydrophilic Coatings
- Hydrophobic Coatings
- Metals
- Polymers
- Composites
- Ceramics
- Glass

Each **Nebula** system can also be configured with a temperature controlled liquid dosing inlet. This is a fully automated device for the introduction of a wide range of monomers to produce permanently functionalised surfaces via plasma polymerisation, greatly extending the range of plasma surface treatment possibilities in a single machine.

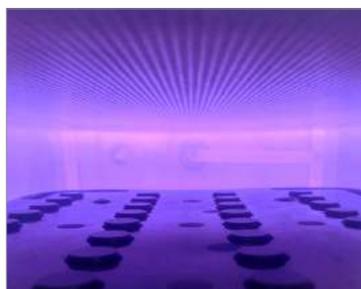


Nebula 150

Vertical sample presentation



Horizontal sample presentation



Touch-screen software



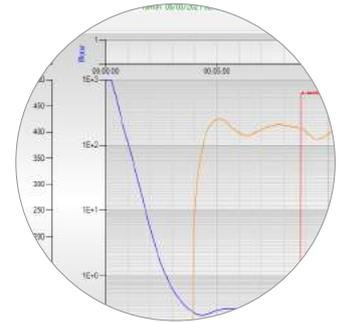
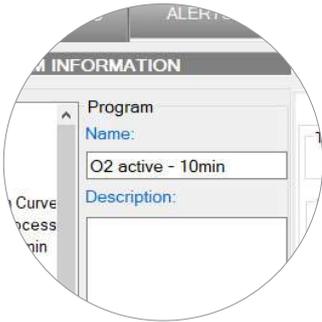
Rotating drum option



In Control

Nebula plasma systems operate under full PLC control via the **Portals™** HMI, a dedicated user-friendly software interface featuring both simple recipe selection with user privilege access levels, and custom configuration options which address both research and production requirements.

Integrated chart and MIMIC diagrams display each process stage in real time, with out-of-limit process alarms, safety interlock status, and automatic data archiving in .CSV format and in the form of a .PDF report.



Powerful Recipe Editor & Library

The built-in recipe editors allow for complete processes to be specified with an unlimited number of steps. Each step in the process can have a unique set of parameters with every parameter having upper and lower thresholds. Password protected access allows suitably qualified personnel to create and edit recipes. Operators on

the other hand can only execute processes from the drop-down recipe library. Up to three gases can be chosen from the extensive gas library and their mixing ratio varied and controlled in any step within a recipe. The high stability plasma power supply and PID controlled pressure regulation deliver highly reproducible results time after time.

Automatic/Manual Operating Modes

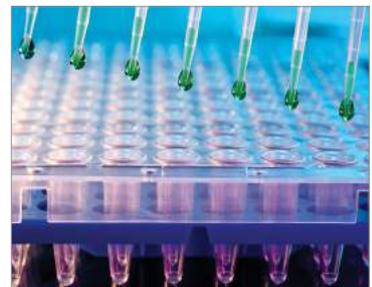
Operators with appropriate access privileges can operate the system in fully manual mode, allowing for rapid testing of new process steps and aiding in system diagnostics. The full user process library is available for execution in automatic operation mode.

Traceability

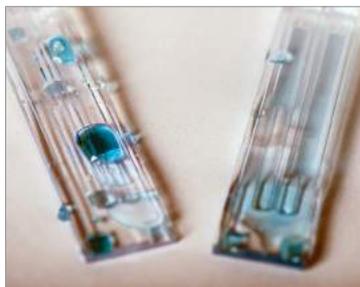
All process data is time and date stamped and stored along with operator details for instant recall and display or for export for offline record keeping and analysis. An optional barcode scanner can be used for further batch traceability in conjunction with plasma process indicator labels for hard copy evidence of successful processing.

Markets & Applications

Medical Plastics



Microfluidics



Plasma Coatings

Hydrophilic coating throughout porous polyethylene filter material



The optional heated liquid inlet is a powerful additional feature for introducing liquid monomers to achieve functional coatings on a wide range of materials. Plasma coatings are uniform, durable and can be applied on any sample geometry to produce a wide range of properties including hydrophilic, hydrophobic and oleophobic surfaces, biocompatible chemistries and biomolecule immobilisation.

Plasma coating steps are included in the recipe editor in the same way as plasma cleaning or plasma activation steps and are also executed with the same level of fine control in a completely automated way.



Access to our extensive process library

Comprehensive surface testing methods

Adhesion and coatings processes

Proof of concept trials

We understand that plasma technology may not be familiar to you, that's ok, it's what we're here to help with.

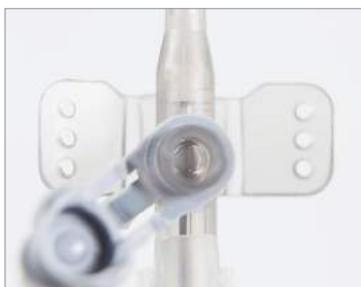
We can provide a free, fast, no-nonsense proof of concept trial to show you what's possible.

Contract treatment

We offer a fast and cost-effective contract plasma treatment service for both small one-off requests and ongoing production.

Process development

We undertake in-house or on-site process development for a wide range of new applications, drawing on more than 20 years real-world experience.



Nebula Specifications

Technical Specifications

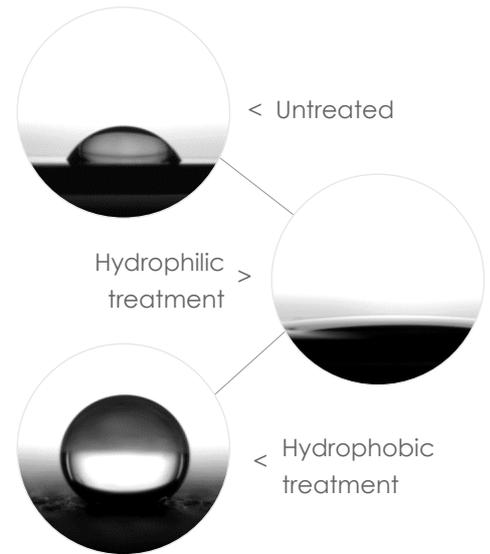
	BASE MODEL	OPTIONS
ENCLOSURE		
Dimensions	W 612mm x H 1875mm x L 852mm (+200mm on side for cables)	
Weight	~100-120kg depending on model	
CHAMBER		
Material	Stainless Steel	
Form	Rectangular	
Dimensions	30L (300x300x365mm), 50L (300x300x560mm), 100L (400x400x625mm), 150L (400x600x625mm), user defined	
REMOVABLE PARTS CARRIER		
Material	Aluminium/Stainless Steel	
Form	Flat horizontal trays, vertical carriers, rotary drum, user defined	
PLASMA POWER SUPPLY		
Power	0-1000W, continuously variable output	
PROCESS CONTROL		
Interface	15" Colour TFT, Windows10, PLC control	unlimited steps/recipes with user access privileges
Gas channels	1 - 3 Digital Mass Flow Controllers	temperature controlled monomer dosing inlet
Vent inlet	x1	soft ventilation option
Purge inlet	x1	
Connections	6mm compression	¼" compression
Pressure gauge	Pirani sensor	Baratron gauge
Vacuum pump	2-stage rotary*	others to suit application, e.g. dry scroll pump, corrosion resistant
*Suitable for use with air, oxygen and other non-corrosive gases		
SERVICES		
Electrical	380-400 VAC/3~/N/PE, max. current 16A/phase, 50Hz	
Compliance	CE - UKCA - ROHS - WEEE	

Henniker strive for continuous improvement and specifications are subject to change without notice

Benefits

- compact stand alone unit
- user friendly recipe driven interface
- unlimited recipes and steps per recipe
- fast treatment time
- precise & repeatable
- no hazardous emissions
- versatile options

Versatility



Products & Services

- benchtop systems
- high throughput systems
- atmospheric plasma
- robot systems
- surface test & analysis
- process development



Henniker are a leading global manufacturer of plasma surface treatment systems and innovative processes. With over 20 years experience our success is built around an exceptional body of knowledge and expertise, backed by highly trained and dedicated staff who understand your application in

considerable detail. Our standard configurations cover most applications but we also understand that no two samples or surfaces are the same. That's why, uniquely, we offer a wide range of options that allow us to customise any standard system for your exact requirement.

Henniker[®] passionate about plasma

CONTRACT PLASMA TREATMENT SERVICE

Our technical staff will be happy to discuss contract treatments, from small one-off batches to regular, large throughput requirements.

PROOF OF CONCEPT TREATMENT

Let's discuss your application and then we will provide a quick, no-nonsense feasibility study.

SURFACE TESTING LABORATORY

With a comprehensive suite of surface analysis equipment, we are able to conduct a wide range of surface property tests, both before and after plasma treatment, in order to provide you with the whole picture.

AFTER SALES SUPPORT

We are proud of our reputation for being approachable, thorough and easy to work with.

"Henniker's after sales support is first class. They have always been extremely responsive if we have ever had need to call on them."

Steve Rackham, Teledyne

RENTAL PLASMA TREATMENT SYSTEMS

We carry a wide range of our standard equipment in stock and available for short or long term hire. This is particularly useful for in-house proof of concept trials or to satisfy short term contract work.

"The low risk option of hiring a plasma unit for evaluation was a key reason that we chose to work with Henniker and one that enabled us to proceed with confidence."

Dr. Chris Nicklin, Reinnervate

METHOD DEVELOPMENT

We have invested significantly in laboratory facilities to assess, test and investigate all aspects of plasma surface modification on a wide range of materials. Coupled with extensive in-house and real-world knowledge, we can usually deliver a tailored treatment quickly and efficiently to suit your individual product or production needs.

"The technical team at Henniker are very knowledgeable and supportive and always approachable. I have found it a pleasure to work with them."

Simon Baxter, BAE Systems, AI

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