

PiezoBrush PZ3-i Plasma Surface Treatment - for semi-automated or automated use



Description

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The Relyon Plasma PiezoBrush® PZ3-i cold plasma unit

provides surface treatment and activation prior to bonding, printing or laminating. Based on the very successful [handheld PiezoBrush PZ3](#), but built specifically for integration into new or existing semi-automated or automated production lines, the **PiezoBrush PZ3-i** combines the effectiveness of plasma surface activation for improved adhesion, wetting, and cleanliness of substrates, with the superior productivity and repeatability of automation and robotics. It is compact, lightweight, modular, safe and efficient – and can be quickly and easily integrated into production lines in partially or fully automated systems, or is stand mountable for benchtop use. The device is intuitive to operate and can be maintained without tools.

Using **Piezoelectric Direct Discharge (PDD®) Technology**, which has been developed by Relyon Plasma, the device transforms low input voltage into high electric field strengths, dissociating and

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ionizing the ambient gas (normally air, but other process gasses can be used). This process generates cold-active plasma at a temperature of less than 50°C, meaning that it can be used to treat temperature-sensitive substrates.

Capable of effectively processing areas at speeds of up to 150mm/s, the system allows the efficient treating of components without delaying subsequent processes, improving productivity. For an optimised process, the system's digital IO gives power output adjustment and on/off function – allowing the pinning down of the process variables: position, power, air pressure and time.

Uses

- Surface treatment of plastics, glasses, ceramics, metals, composites and natural materials
- Activation of a wide variety of base materials
- Optimisation of bonding, printing and lamination processes
- Selective improvement of wettability
- Fine cleaning of surfaces, odour reduction
- Alternative to chemical primers, flame treatment processes and mechanical roughening

Installation

One advantage of the **PiezoBrush** is that excitation of gas molecules is highly efficient and safe – but with a very high power density. In practice, a processing performance level is now achieved that had previously been possible only by means of considerably larger installations. The **PiezoBrush PZ3-i** does not require an elaborate infrastructure and is easy and intuitive to integrate and operate.

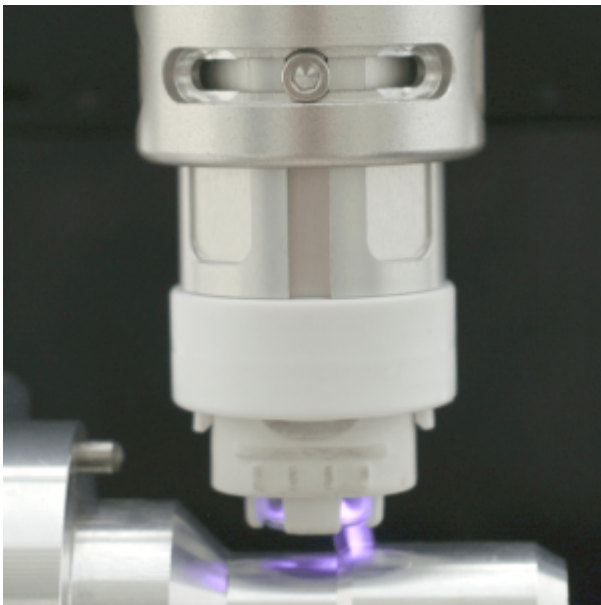
Should you require a purpose-built system for your semi-automated application, our technical team are able to integrate surface preparation equipment, [dispensing valves and pumps](#), [curing lamps](#) and [material feed reservoirs](#) into an [archytas enclosure](#), customised for your particular needs.

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The [PiezoBrush PZ3](#) is also available in a convenient and lightweight handheld format, granting the benefits of plasma surface treatment with several built-in process control features.

Features & Benefits



- Uses “cold plasma” to enable treatment of temperature-sensitive substrates
- Control over variables (positioning, power, time, input gas pressure) for a repeatable, controllable

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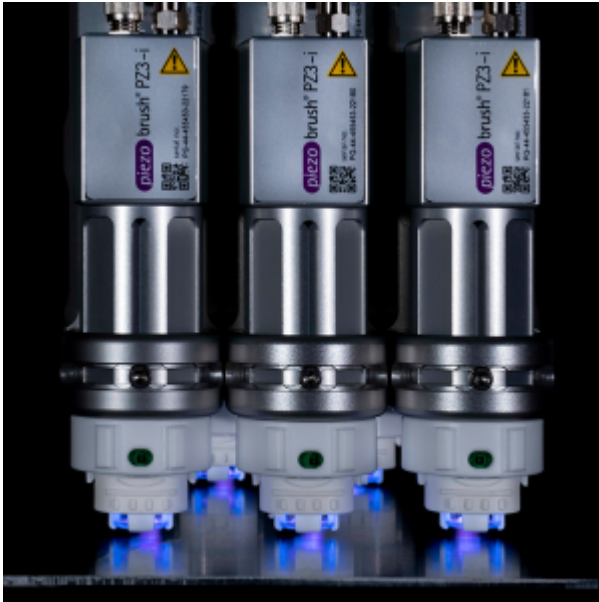


and recordable process

- Robot or machine mountable for precision and productivity
- Very simple to implement – lightweight, only requires 24V DC power and dry compressed air
- Control of output power via a variable 24V DC input
- Safe – generally no light barrier, mechanical enclosure or PPE required. Local ventilation recommended
- Efficient and environmentally friendly – energy efficient, no chemicals, no consumables
- Reduces health & safety concerns from primers
- Interchange plasma modules without tools for substrate and process changes
- Modular design allows multiple units to be mounted adjacently for wide or large area treatment
- LED status lights and I/O indicate faults

Applications

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The PiezoBrush PZ3-i is suitable for use in semi-automated

and automated production lines in applications including:

- **Medical**

Filters, cell wells, test tubes, catheters, syringes, petri-dishes, needle hubs, lenses

- **Automotive**

Fuse covers, engine parts, air bag covers, rubber profiles, tubing, headlights

- **Electronics**

Cable, switches, polyester pcb's, housings & enclosures, screens

- **Consumer**

Irons, blenders, shakers, measuring containers

- **Food, cosmetics & drug**

Bottles, caps, jars, tubes

- **Professional model making**

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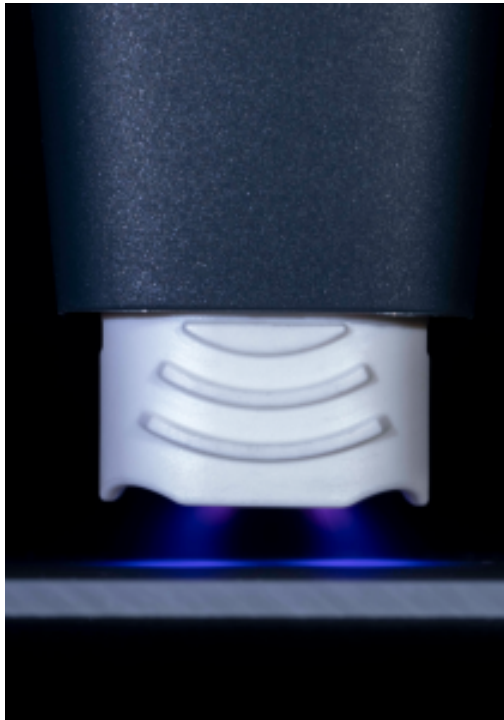
Preparing materials such as glass, GRP, ABS and other synthetic materials for bonding

The PiezoBrush allows simple germ reduction on a great variety of surfaces such as glass, plastics or metals and thus provides excellent support in effecting processes in the field of microbiology, medicine, microfluidics or food engineering.

In order to achieve optimised surface activation for different substrates, the PiezoBrush PZ3-i has been equipped with four interchangeable modules (the same modules as the [PiezoBrush PZ3](#)).

The device detects which module is installed and automatically adjusts the parameters accordingly.

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Standard module

This module is designed for the surface treatment of non-conductive substrates such as plastics, ceramics or glass. For effective treatment, a module-to-substrate distance of 1 to 5 mm is recommended. If uncontrolled arcing occurs on the substrate during use, the device switches off automatically. In this case the surface is at least partially conductive and should therefore be treated with the Nearfield module.

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Nearfield module

This module is used to treat electrically or partially electrically conductive materials such as metals, CFRP, indium tin oxide or conductive plastics. However, this module may also be necessary for the ideal treatment of materials with conductive coatings or assemblies with conductive components. With this module, the plasma only ignites when it is close enough to a conductive surface (this may also be hidden under a thin insulating layer). At a distance of a few millimetres, a violet glow is visible in the gap between module and substrate indicating that the treatment is being performed.

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Needle module

The Module Needle is suitable for treating small or hard-to-reach areas in non-conductive materials. It can be used to treat narrow grooves, bores or other cavities, as very fine processing is performed with the needle.

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Multigas module

This module can be operated with the inert gases nitrogen, argon or helium to improve surface activation of difficult-to-bond substrates, such as PTFE. It is used in combination with a silicone hose, which is plugged onto the gas connection.

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Nearfield Needle module

The Module Needle is suitable for treating small or hard-to-reach areas in conductive substrates such as CFRP, indium tin oxide or conductive plastics. It can be used to treat narrow grooves, bores or other cavities, as very fine processing is performed with the needle.

Specifications

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Specification	
Typical treatment speed	1 - 15 mm/s (fine cleaning) 10 -150 mm/s (bonding) 100 - 1500 mm/s (printing)
Typical treatment distance	2 - 10 mm
Typical treatment width	5 - 29 mm (compressed air), up to 50 mm (nitrogen), modularly expandable
Plasma gas temperature	< 50 °C
Process control	Communication interface and status monitoring
Modules	Standard and nearfield
Module position	Individually and independently adjustable
Activation efficiency	90 m ² /kWh
Process gas	Compressed dry air, nitrogen. other gas types on request
Dimensions (mm)	40 x 157 x 71

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Specification	
Electrical connection	24V DC
Weight	370g

Other Information


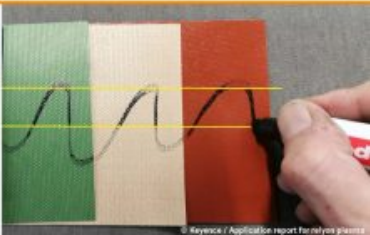
Find out more about the technology behind the PZ3-i by reading our [technical bulletins and white papers](#):

- [Cold Plasma in the Electronics Industry](#)
- [Plasma Technology for Surface Cleaning](#)

See how the **PiezoBrush** works as part of real applications in this plasma surface treatment [Case Studies](#):

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<div><p>CASE STUDY</p><p>intertronics adhesives, coatings, sealants & equipment for manufacturing and technology applications</p><p>piezobrush PZ2 Plasma surface treatment system</p><p>Copyright Creabis GmbH</p></div>	<p><u>Increasing the strength of bondlines in 3D printed assemblies threefold</u></p> <p>A significant challenge for Creabis GmbH, a 3D printing service provider, is the 3D printing of large and complex components, as normally 3D printers have maximum component dimensions of ~600mm. To make use of the advantages of 3D printing for larger components, they are printed as individual parts and then bonded together. Plasma surface treatment greatly enhances the strength of the bonds on these 3D-printed assemblies.</p>
<div><p>CASE STUDY</p><p>intertronics adhesives, coatings, sealants & equipment for manufacturing and technology applications</p><p>piezobrush® PZ3-i Plasma Surface Treatment device</p><p>© Keyence / Application report Functional plasma</p></div>	<p><u>Plasma pre-treatment for PTFE fabric</u></p> <p>A leading tool solutions company for surface finishing required a way of safely and effectively marking low surface energy PTFE fabrics using continuous inkjet printing. To establish a reliable method of increasing the surface energy, it turned to the PiezoBrush® PZ3-i.</p>

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Ordering Information

Part number	Description
REL1000700001	Relyon PZ3-i PiezoBrush for automated applications
REL1000700100	Relyon PZ3-i connection line package
Modules	
REL1000650100	Relyon Plasma PiezoBrush PZ3-i - standard module
REL1000650200	Relyon Plasma PiezoBrush PZ3-i - nearfield module
REL1000650300	Relyon Plasma PiezoBrush PZ3-i - multigas module
REL1000650400	Relyon Plasma PiezoBrush PZ3-i - needle module

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Part number	Description
REL1000650501	Relyon Plasma PiezoBrush PZ3-i - nearfield needle module

Let's start by talking about your application

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- Name*
- Company*
- Phone*
- Email*
- Post code*

If you're in the UK, knowing your postcode would help us get in touch even more quickly. If you're outside the UK, please indicate your country.

-
- Tell us about your application

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Last updated: February 2024 Version: 1.6
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