

Tucano.

A compact system that transforms surfaces with the precision of plasma: cleaning, activation and modification, all in a single professional instrument.



200 W

RF Power

13.56 MHz

RF Frequency

5.9 litres

Chamber volume

0.1-1 mbar

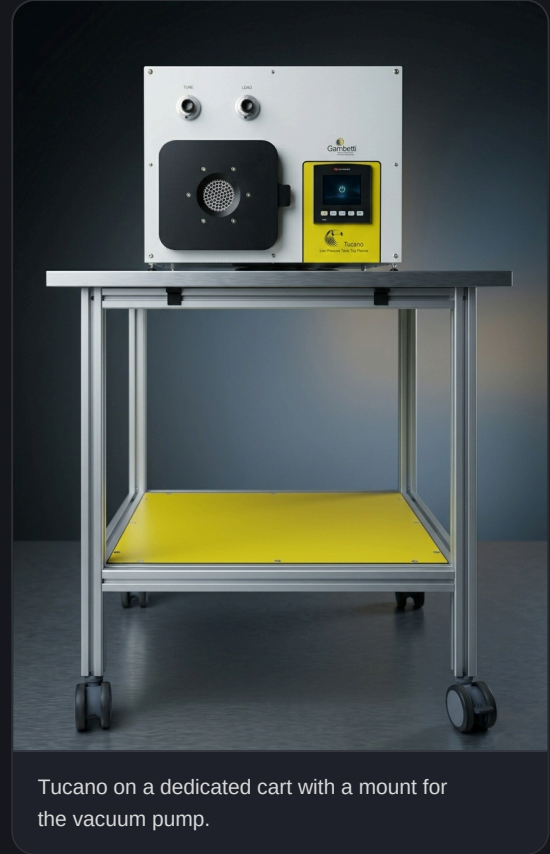
Process pressure

Versatility and precision in a bench-top format

The **Tucano** is a bench-top plasma reactor in a capacitive configuration, RF-powered at 13.56 MHz with power adjustable up to 200 W. It treats surfaces of many different materials: from metals to plastics, from ceramics to glass and even paper.

The cylindrical chamber is made entirely of bare aluminium, weld-free, with a hinged door in black anodised aluminium and a shielded inspection window. The RF electrodes are flat and parallel, featuring the exclusive Dark-Shield technology.

Control is handled by a PLC with a colour touch-screen display. In manual mode the process parameters can be fine-tuned to reach the optimal result and saved as a recipe. The system stores up to **10 recipes** with two process steps, ensuring full batch traceability. The only manual operation required is loading and unloading the samples.



Proprietary RF generator

13.56 MHz, adjustable from 5 to 200 W in 1 W steps.

Bias voltage readout

Determines the kinetic energy of ion bombardment on the sample.

Selected components

Gas-control and vacuum-measurement instrumentation from leading suppliers, so every process parameter stays under control.

Weld-free chamber

Solid aluminium, externally anodised door with a shielded window.



EXCLUSIVE TECHNOLOGY

Dark-Shield electrode

With the Dark-Shield configuration, ion energy is directed with surgical precision straight onto the sample, drastically reducing process losses and dispersion. The grounded upper shield creates an asymmetric field that steers the ions where they are needed, onto the surface to be treated.

The result is a plasma-substrate coupling of superior quality compared to any glass-chamber or standard-electrode system: more uniform treatments, greater energy efficiency, and repeatability that conventional systems cannot match.

*Less dispersion. More control.
More repeatability.*

One system for research and production

Tucano works on metals, plastics, ceramics, glass, textiles and paper, from recipe development in the lab to small-scale production.

Microfluidics

Surface activation and hydrophilisation of microchannels in PDMS and technical polymers, glass-polymer and polymer-polymer plasma bonding, chemical functionalisation for biosensors and biomolecule immobilisation, deposition of anti-fouling and biocompatible coatings, atomic cleaning and decontamination of microfluidic devices.

Lab-on-Chip

Surface activation for the integration of biosensors and biochips, wafer bonding and hermetic sealing of diagnostic cartridges, functionalisation for the immobilisation of DNA, antibodies and enzymes, plasma deposition of functional films and thin electrodes, low-temperature sterilisation and atomic cleaning for miniaturised diagnostic devices.

Semiconductors & MEMS

Photoresist stripping, ashing of organic polymers, pre-wire-bonding cleaning, isotropic etching.

Biomedical

Hydrophilisation of dental implants, bonding of medical devices, low-temperature sterilisation.

Plastics industry

Pre-bonding cleaning, activation before painting, fluorination, surface crosslinking.

Precision engineering

Atomic cleaning of metal and ceramic surfaces for PVD coatings and high-quality painting.

Optics & ophthalmics

Pre-treatment for anti-reflective and anti-scratch coatings, anti-fog layers on lenses.

Textiles

Hydrophilisation of natural and synthetic fibres before dyeing or printing.

SEM & TEM microscopy

Sample preparation and cleaning, removal of organic layers, ashing of biological tissues.

Photovoltaics

Isotropic removal of silicon nitride, silicon texturing for more efficient cells.

Specifications

DIMENSIONS

Footprint	482×532×385 mm
Net weight	34 kg

CHAMBER

Material	Aluminium
Internal volume	5.9 litres
Dimensions	Ø153 × L324 mm

ELECTRODES

Configuration	Parallel plates + Dark Shield
Tray area	118 × 310 mm
Working gap	68 mm

RF SIGNAL

Max power	2–200 W, 1 W step
Frequency	13.56 MHz

PROCESS GAS

Available flows	2–50 sccm
Gases	Air, N ₂ , Ar, O ₂ , etc.
Gas lines	2 via MKS

CONTROL

Interface	PLC, colour touch screen
Storable recipes	10 recipes, 2 steps
Access levels	Multi-user

UTILITIES

Power supply	100–240 VAC, 5.2 A, 50/60 Hz
Standard gas inlet	6 mm OD, compression
Gas pressure	1–1.5 bar(G)
Exhaust	NW16 ISO-KF
Vacuum pump	Edwards RV5F, 5 m ³ /h
Optional	Chemical scroll pump

COMPLIANCE

Certification	CE Marked
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Publications

A selection of the more than forty peer-reviewed articles, published by international universities and research centres, that cite the Tucano system.

BIOMEDICAL & IMPLANTS

Canullo, L., Cassinelli, C., Götz, W., & Tarnow, D. (2013). Plasma of argon accelerates murine fibroblast adhesion on titanium disk. *International Journal of Oral & Maxillofacial Implants*, 28(4), 957–962.

Polini, A., Pagliara, S., Camposeo, A., et al. (2011). Biosilica electrically-insulating layers by soft lithography-assisted biomineralisation. *Advanced Materials*, 23(40), 4674–4678.

MATERIALS & SURFACES

Mandolfino, C., Lertora, E., Gambaro, C., & Bruno, M. (2014). Improving adhesion performance of polyethylene surfaces by cold plasma treatment. *Meccanica*, 49(10), 2299–2306.

Scaffaro, R., Maio, A., Agnello, S., & Glisenti, A. (2012). Plasma functionalization of multiwalled carbon nanotubes. *Plasma Processes and Polymers*, 9(5), 503–512.

MICRO & NANOTECHNOLOGY

De Caro, L., Altamura, D., Arciniegas, M., et al. (2016). Ptychographic imaging of branched colloidal nanocrystals in polystyrene films. *Scientific Reports*, 6, 19397.

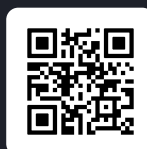
Angeli, E., Manneschi, C., Repetto, L., Firpo, G., & Valbusa, U. (2011). DNA manipulation with elastomeric nanostructures fabricated by soft-moulding. *Lab on a Chip*, 11(15), 2625–2629.

ELECTRONICS & CATALYSIS

Pastor-Pérez, L., et al. (2018). CO₂ valorisation via Fischer-Tropsch catalysis over plasma-treated supports. *Applied Catalysis B: Environmental*.

Greco, F., Zucca, A., Taccola, S., et al. (2013). Patterned free-standing conductive nanofilms for ultraconformable circuits. *ACS Applied Materials & Interfaces*, 5(19), 9461–9469.

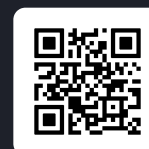
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