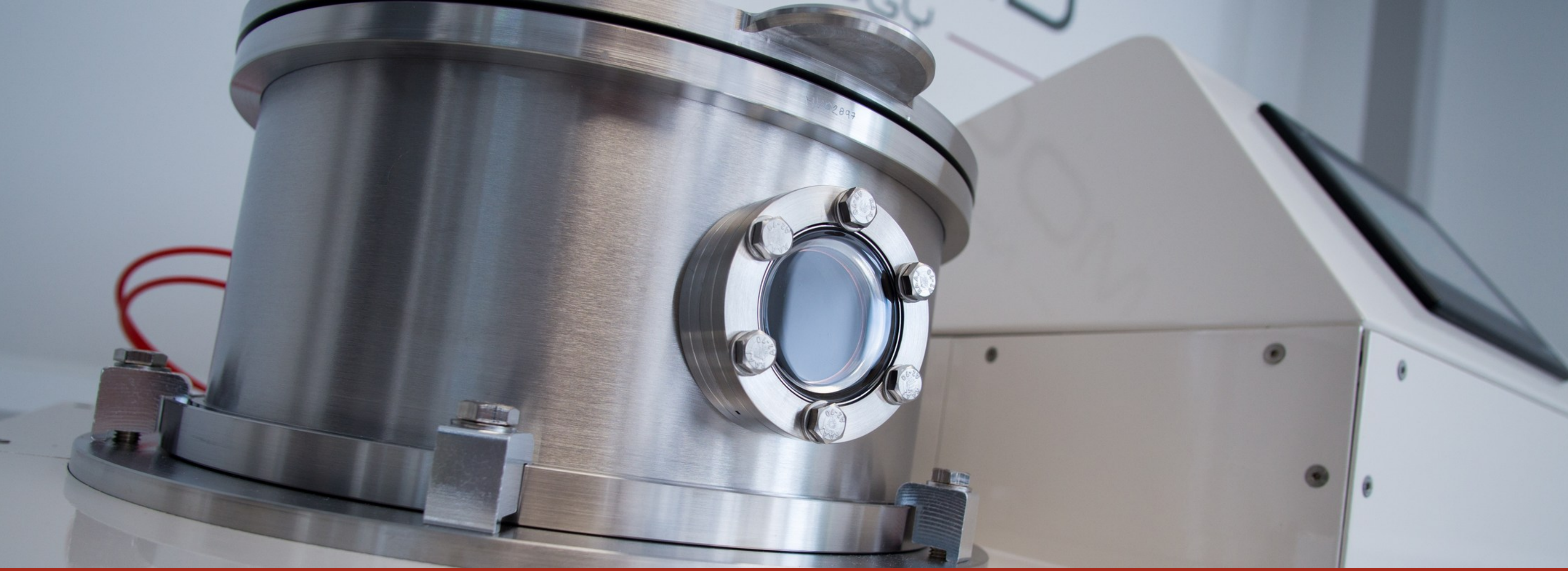

PRECISION PLASMA ETCHING SYSTEM

nanoETCH

Compact reactive ion etching and surface modification for low-damage advanced materials research.

6″	$<5\times10^{-7}$	3	<5 W
MAX STAGE	BASE PRESSURE (MBAR)	PROCESS GASES (UP TO)	SOFT-ETCH POWER

Low-damage plasma etching in a compact benchtop platform

The nanoETCH is a benchtop reactive ion etch (RIE) and surface-modification platform engineered for high-performance fluorine-based RIE with a precision soft-etch capability. It delivers the uniformity and repeatability needed for sensitive materials — graphene, 2D materials, h-BN, SiO_2 and Si — giving research teams controlled, low-damage plasma processing and recipe-led development without tying up larger cleanroom tools.

- Controlled low-damage plasma processing
- Soft-etch powers <5 W, down to ~100 mW
- Substrate stages up to 6″ (150 mm)
- Fluorine-chemistry RIE (SF_6 / CHF_3) plus soft-etch
- Up to 3 MFC-controlled process gases
- Recipe-led operation via touchscreen HMI

Why choose the nanoETCH

Faster etch process cycles
Keep plasma-etch development close to the group, shorten feedback loops and change processes without waiting for shared cleanroom tools.

Ease of use for mixed teams
Touchscreen operation, recipe-led workflows and a compact footprint support daily use by researchers and students.

Low-damage research flexibility
Controlled plasma processing for sensitive materials, graphene, 2D materials and surface activation.

Lower operational friction
Add local etch and surface-processing capability without production-scale infrastructure or access constraints.

Key features

Soft-etch mode
Precisely-controlled low powers (<5 W, to ~100 mW; 20 mW resolution) for sensitive materials and ultra-low etch rates.

Fluorine-chemistry RIE
Configurable for SF_6 or CHF_3 for more aggressive reactive ion etch processes.

High-vacuum performance
Turbomolecular pumping for base pressures below 5×10^{-7} mbar.

Configurable gas handling
Up to three MFC-controlled process gases — argon, oxygen and fluorine chemistries.

Recipe-based touchscreen control
Fully automatic operation, multiple saved recipes and PC data-logging.

Compact benchtop design
Cleanroom-compatible, serviceable platform that adds etch capability close to the team.

Operating modes & configurations

Start with a proven approach, then tailor power, gases, stage and monitoring around your materials and target process.

Soft-etch mode

Precisely-controlled low powers for highly sensitive materials.

- <5 W down to ~100 mW
- 20 mW control resolution
- Graphene & thin resists (e.g. PPA)

Fluorine-chemistry RIE

SF_6 / CHF_3 for more aggressive, controlled etching.

- h-BN, SiO_2 and Si etching
- Controlled, repeatable etch rates
- e.g. SiO_2 at ~1.3 Å/s

Plasma cleaning & activation

Argon / oxygen surface preparation and modification.

- Substrate cleaning and etch
- Surface activation
- Repeatable development runs

Technical specifications

Parameter	Specification
System type	Benchtop reactive ion etch (RIE) & surface modification
Process type	Plasma etch, RIE & surface activation
Etch modes	Soft-etch + fluorine-chemistry RIE
Soft-etch power	<5 W, to ~100 mW; 20 mW resolution
RF power	Precision RF, <30 W
Process gases	Up to 3 MFC-controlled (Ar, O_2, SF_6 / CHF_3)

Parameter	Specification
Base pressure	$<5\times10^{-7}$ mbar (turbo-pumped)
Substrate stage	Up to 6″ (150 mm)
Control	Touchscreen HMI; PC data-logging
Recipe control	Define / save multiple recipes
Servicing	Easy-service; full safety interlocks
Cleanroom compatible	Yes
Warranty	2 years

Configurable platform; exact specifications depend on the final build and are confirmed at quotation.

Selected applications & publications

- Chemistry-based fluorine etch of h-BN, SiO_2 and Si — Moorfield application note
- Graphene soft-etching with the nanoETCH — Moorfield application note
- Direct synthesis of nanopatterned epitaxial graphene on SiC — University of Technology Sydney
- Argon plasma substrate cleaning and etch — Moorfield application note
- Soft-etch of PPA thermal resist for NanoFrazor t-SPL stacks — Heidelberg Instruments Nano
- sp^2-rich dendrite-like carbon nanowalls for nitroaromatic sensing — Gdańsk University of Technology

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