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5 reasons to do graphene transfer in Your own lab using semi-automated system for electrochemical delamination

"Cambridge Graphene Technology Days 2015
Business Conference, 6 November
<http://www.hvm-uk.com>"

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WW Sales Manager
Nano Carbon sp. z o.o.



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Presentation outline

About Nano Carbon sp. z o.o.

Why to do transfer in own lab

Semi automated system is now
commercially available from NC



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Nano Carbon sp. z o.o.

Graphene Producer

Application Developer

51% Polish Armament Group

49% KGHM TFI III FIZAN S.A.





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Application Development

GRAPHICA – *Graphene for Integrated Circuit Applications*

GRAFEL – *Advanced graphene-elastomer composite sealings*

OPTIGRAF – *Protective and heating graphene layers for optical elements*



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Main Research Partner

R&D and production located at

Institute of Electronic Materials Technology

133 Wolczynska St
Warsaw, Poland





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Graphene production

Graphene on Silicone Carbide

Graphene on Copper 30x30cm

Graphene transfer

Graphene flakes and dispersions

Graphene production using multiple reactors

Multiple reactors from different manufacturers are available at ITME



AIXTRON



SECO/WARWICK



CVD
Equipment
Corporation

We are ready to sign Service Level Agreement to ensure supplies

CVD Epitaxial Growth of Graphene on Copper

- Fully automated 1-step clean proces.
- Samples up to 12x12 in commercially available at:

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- Samples can be vacuum packed in the cleanroom just after production.
- Production proces takes few hours, (depends on reactor being used).





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Graphene transfer

Graphene transfer to:
PET, Si, SiO₂, custom substrates

<< Automated electrochemical
delamination system





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Results of our transfer method

Properties of Chemical Vapor Deposition Graphene Transferred by High-Speed Electrochemical Delamination.

J. Phys. Chem. C, 2013, 117 (40), pp 20833–20837

[Tymoteusz Ciuk](#), [Iwona Pasternak](#), [Aleksandra Krajewska](#), [Jan Sobieski](#), [Piotr Caban](#), [Jan Szmidt](#), and [Wlodek Strupinski](#)

5 reasons to transfer Graphene in Your own lab

Safer - You don't have to share technical details of your application before Your product is ready

Faster - Full control over the transfer proces

Cleaner – Each particle on the surface may affects quality

Cheaper - Please compare the prices of transferred graphene from comercial manufacturers, especialy for custom samples

Optimized - You will always know more about Your substrate and Your application than anybody else



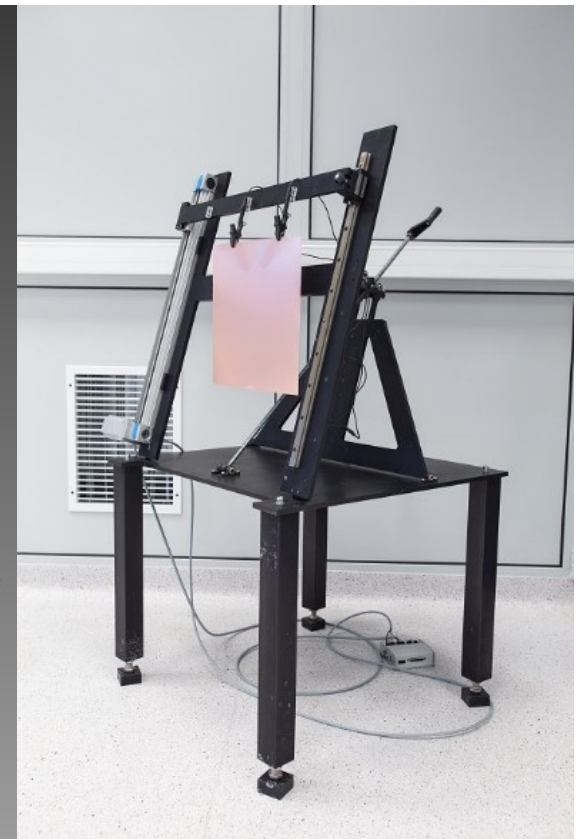
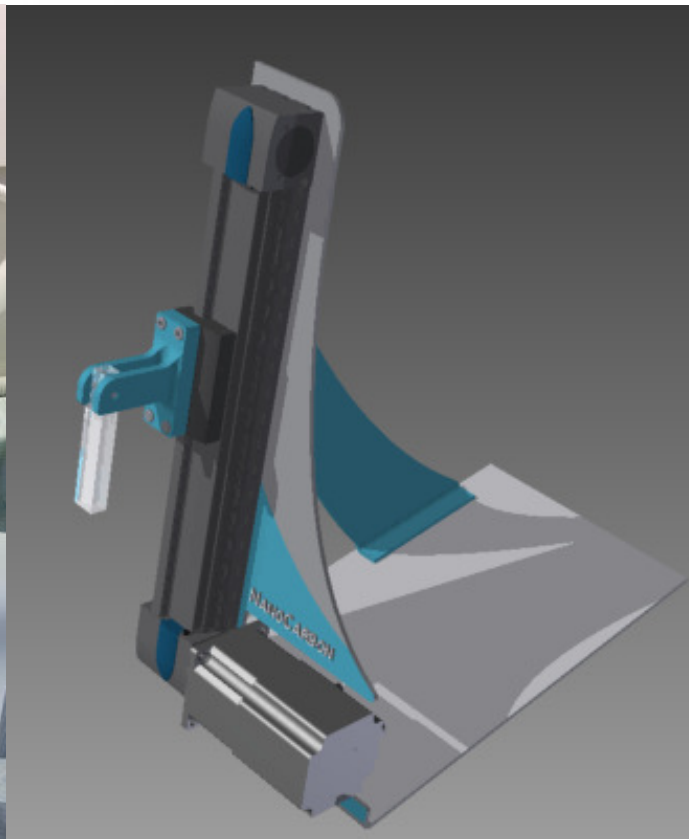
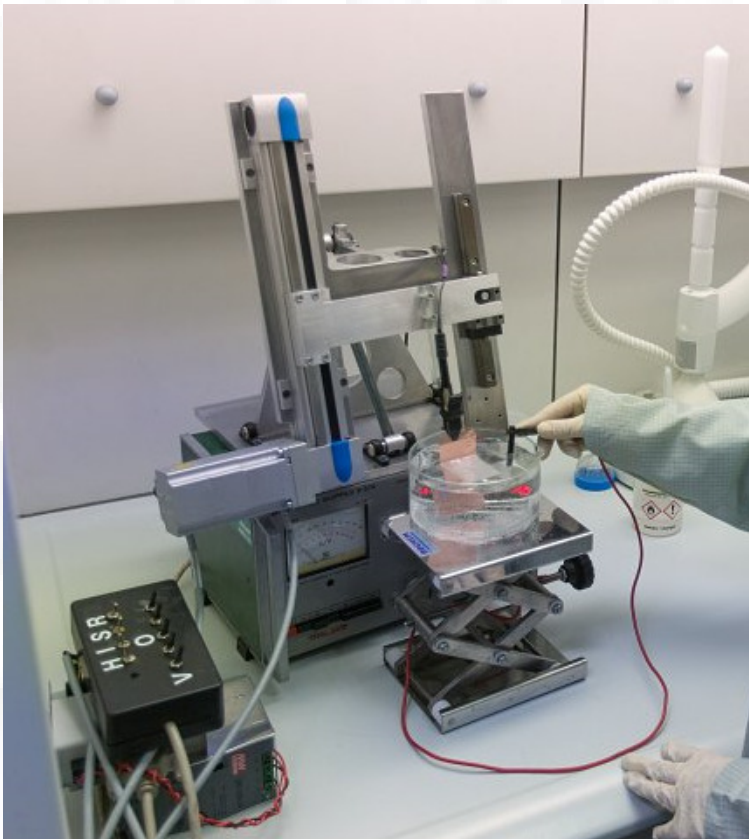
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Semi automated delamination system

Prototype working in our lab

Commercial systems





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Delaminator at a glance

- Regulated delamination speed (multiple speeds available)
- Regulated insertion angle
- Regulated output current
- Interchangeable electrodes

Two options available:

- **Lab system:** Samples up to 2in wide (~5cm)
- **Large System:** Samples 12 in or wider (>30cm)



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Thank You for Your attention

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