

CYRANNUS®

diamond systems by iplas



R&D100 Award 2003



Young Female
Entrepreneur Award
2000

„Aus den praktischen
Erfahrungen mit den
Hidden Champions lernte
ich mehr über
Management als in zwei
Jahrzehnten
wissenschaftlicher
Forschung“

Prof. Simon (founder of
Simon, Kucher & Partners)

CYRANNUS®
cylindrical
resonator with
annular slots

int. patents approved or
pending, e.g.

EP 97906173

EP 98928283

EP 0872164

US 6204603 B1

US 6198224

US 6543380

JP 531466

JP 524812

CYRANNUS® technology enables
efficient large area coating with
high deposition speed



CYRANNUS® technology

Plasma easy to apply!

diamond process

Synthesis of diamond can be done with high efficiency in plasma processes. The variety of applications is very broad and promising, but technical constraints of conventional plasma technology limited the development of production technology.

microwave plasma

- high efficiency, high critical ion density
- clean process by excitation without electrodes
- free selection of process gas, precursor

configuration

- direct plasma treatment / deposition
- process gas feeding on top of substrate, inside plasma source

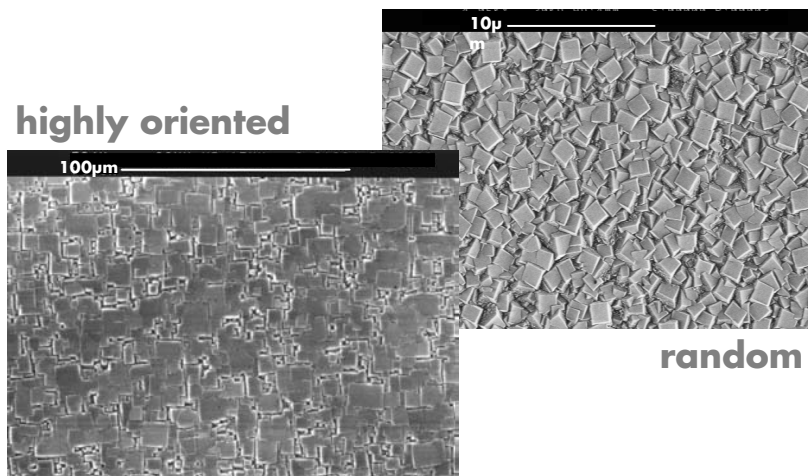
chemistry

- hydrocarbon: supply of coating material
- hydrogen: support of sp^3 bonding formation
- oxygen species: etching of graphite phase / sp^2 bonding
- inert gas: buffer gas or nano crystalline structure

coatings

- crystalline diamond
- highly oriented diamond
- nano crystalline diamond
- carbon nano-tubes / diamond like carbon

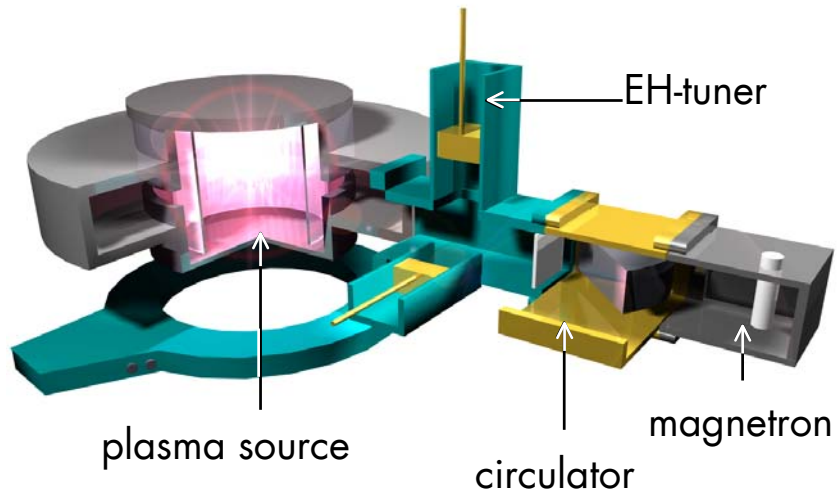
SEM image of diamond on silicon



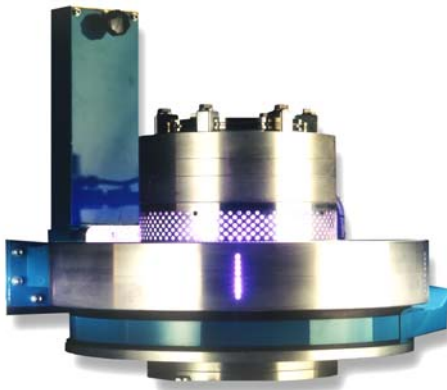
CYRANNUS[®] plasma source

CYRANNUS[®] represents an innovation in plasma technology. The plasma source is a stable, reliable tool which can be used with very few limitations.

principle



technology



- spatial homogeneous plasma
- from vacuum to ambient pressure
- arbitrary process gas
- high gasflow possible
- plasma excitation without electrodes
- reliable operation

CYRANNUS[®] I-6"
plasma source
depositing diamond

plasma system

plasma source	CYRANNUS® 6" / 10.5" available, larger size on request / diameter of plasma chamber 6" for 3-4" wafer or 10.5" for larger wafers
microwave	2,45 GHz / 6kW continuous wave switch mode power supply
tuner	automated EH tuning element controlled by PLC different working modes for easy operation
substrate holder	heated or cooled substrate holder (optional) prepared for bias (optional) automated substrate positioning inside reactor (optional)
vacuum	chamber directly connected to plasma source load lock door for substrate feeding double step rotary vane pump with N ₂ bypass
process gas	individual gas flow controller pressure control gas shower inside plasma source on top of substrate
automation	control system built of modular devices PLC Simatic* S7 field bus Profibus* process parameters displayed input or change of process parameters on screen process documentation module (optional)
safety	multiple secured safety circuits interlocks by hardware and PLC CE conformity * trademark by Siemens AG (other PLC or field bus on request)

For further questions please contact:

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