

# CYRANNUS®

## plasma applications



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

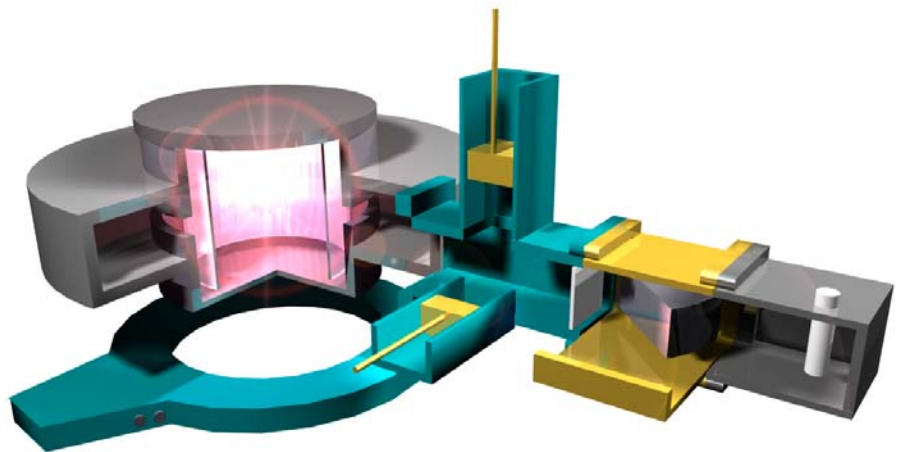
US 6198224

US 6543380

JP 531466

JP 524812

The innovative **CYRANNUS®**  
technology is advantageous  
for various plasma processes



**CYRANNUS®** technology

*Plasma easy to apply!*

# Applications

Plasma is a high energy containing gas which can be used for treatment of various surfaces or for reactions in the gas phase. The variety of applications cover a large spectrum of branches. Therefore plasma technology is a key technology.

## etching / ashing

removal of photo resist, stripping of coatings  
⇒  $>1-6 \mu\text{m}/\text{min}$ , 10-15sec for desmearing

removal of oxides from metal

⇒ lead frame cleaning within few seconds

## cleaning

ultra cleaning, degreasing

⇒ fast on-line cleaning

## activation

improved wetting of varnish, increased adhesion

⇒ 3D plastics activation, 1-10 sec,  $>70 \text{ dyn}/\text{cm}$

## functionalisation

hydrophobic surface

⇒  $< 10 \text{ sec}$

surface conditioning for thermal bonding of metal and PE without adhesives

## deposition

various coatings (scratch resistance, optics)

⇒ growth rate of several  $\mu\text{m}/\text{min}$ (SiOx) or  $10 \mu\text{m}/\text{h}$ (diamond)

diamond structures

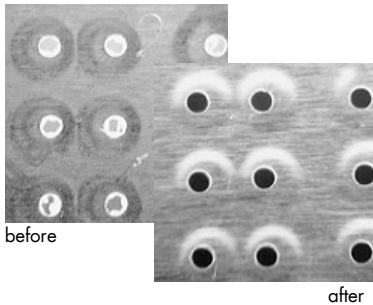
⇒ windows, free standing structures, MEM

## complete cracking of molecules

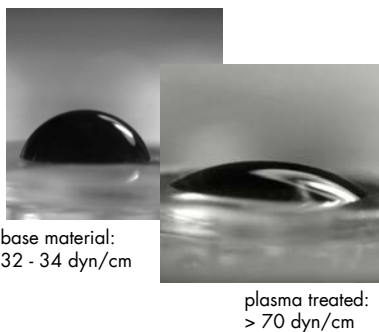
destruction of molecules, oxidation

⇒ abatement, exhaust cleaning, waste destruction

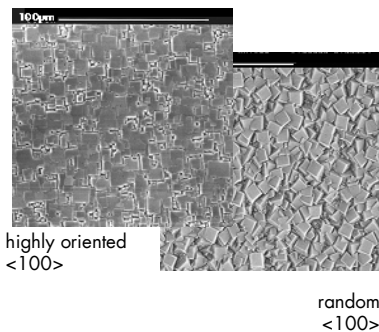
### desmearing



### polymer activation



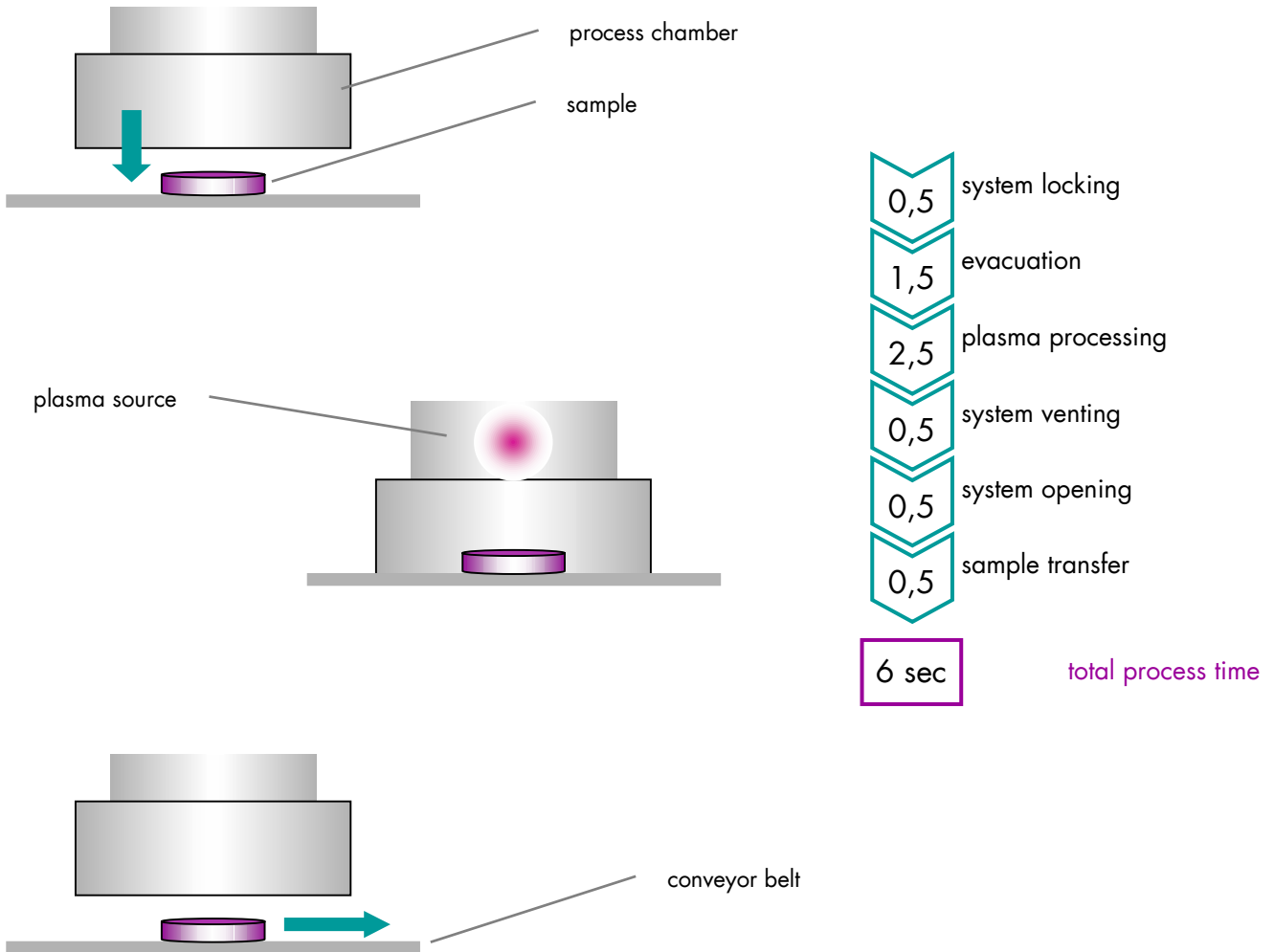
### diamond deposition



# In-line and on-line processes

CYRANNUS® enables plasma processes with in-line or on-line operations as well. A simplified set-up due to medium pressure operation allows very short treatment time and fast material handling.

## Operation sequence



## Process scalability

- Arrays of linearly shape plasma sources for larger parts
- Faster feeding mechanisms by duplicated locking systems

# more about iplas . . .

## reliability and short process time

are two of the greatest advantages *CYRANNUS*<sup>®</sup> technology provides. They are the key factors for successful plasma technology in production. iplas is the exclusive provider of the unique *CYRANNUS*<sup>®</sup> equipment for generating uniform, homogeneous, microwave excited plasma from vacuum to ambient pressure with arbitrary gas.

## products

- ◆ *CYRANNUS*<sup>®</sup> plasma sources with sizes from
- ◆ fully automated plasma systems for production
- ◆ manual operated plasma systems for R&D
- ◆ individual R&D service with iplas engineers and equipment

## business

iplas covers several fields of plasma technology as shown in this leaflet. Synergy effects from developments in various applications of medium to ambient pressure plasma are the basis of world leading know-how in medium pressure plasma processes.

## our goal

It is our intention to supply plasma technology with highest advantage for users. This includes that our customers should not have to care about the plasma. iplas will take on all plasma problems for you with innovative solutions for production!

*CYRANNUS*<sup>®</sup> Pat. No. WO 97 / 25837  
trademark by iplas

For further questions please contact:

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