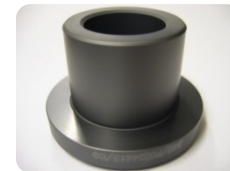


Extreme amorphous carbon materials applied using plasma-assisted CVD

Chris H. Walker B.Eng (Hons) DipM MCIM AIMEchE
CEO, Director
Diamond Hard Surfaces Ltd



Background

- Founded 2005
- VC Backed – Oxford Technology
- Developed for Space
- Patented Process Dec 07
- First Production customer Jan 08
- Full production facility Sep 09
- ISO 9001/ISO14001 Aug 10
- Production and Development



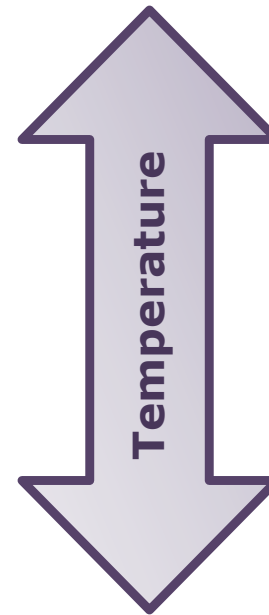
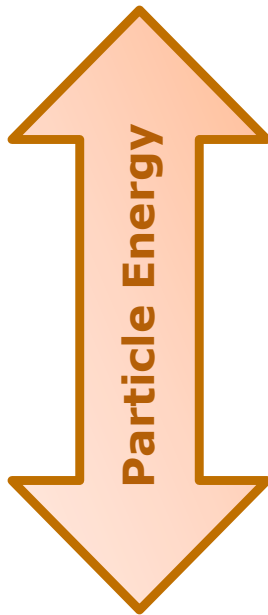
Key Business Areas

- Chemical Processing
- Oil and Gas Exploration
- Industrial Processing
- Aerospace
- Medical

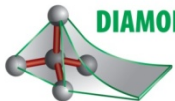


Material Characteristics Influencing Factors

sp^3



sp^2



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Key Advantages (USP's)

- Extreme Hardness
- Excellent adhesion
- Thicker than other coatings
- Low friction
- No pre or post processing
- Engineered to application
- Low process temperature



Material Experience

Metals:

- Steel – SS, Inconel etc
- Copper
- Aluminium
- Titanium
- Chromium

Ceramics:

- Tungsten Carbide
- Silicon Carbide
- Silicon Nitride
- Silicon
- Alumina
- Silicon Oxide

Thermoplastics:

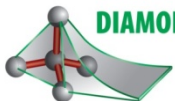
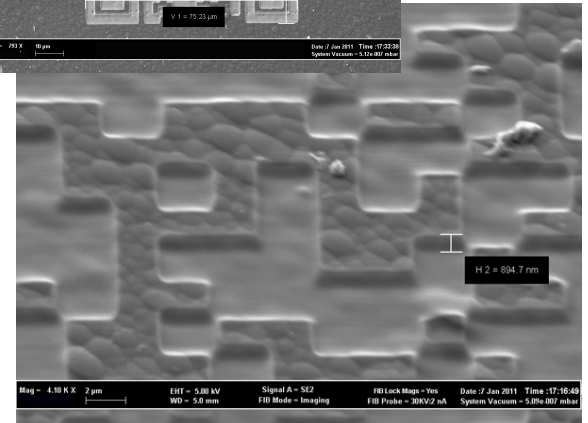
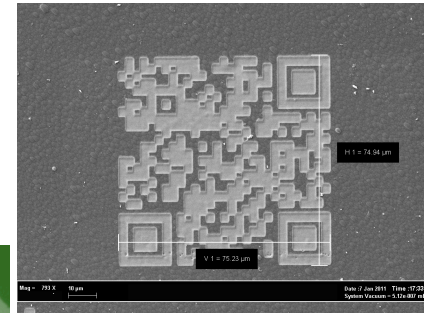
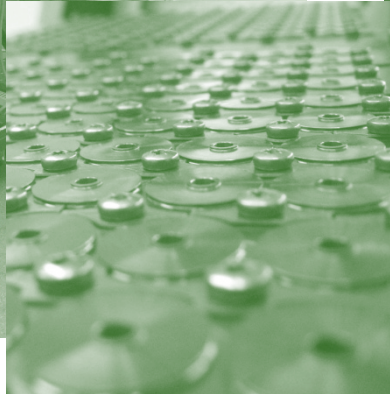
- PEEK
- Polyimide
- Kevlar

Conclusions:

- Very versatile material
- Diamond Hard have a lot of experience of coating



Macro - Micro - Nano



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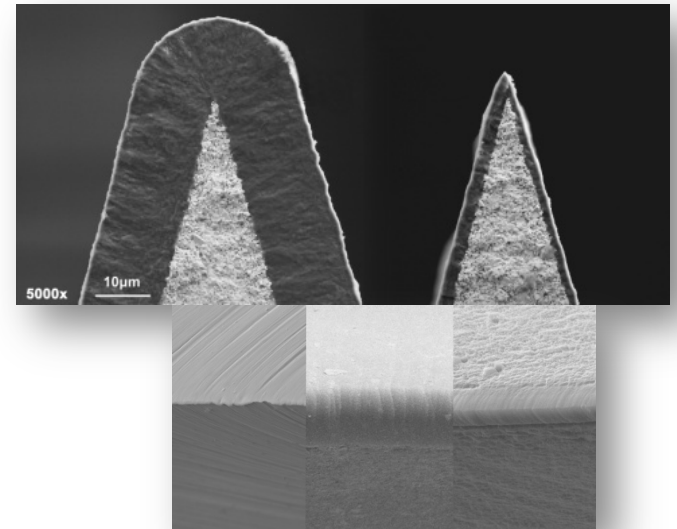


Case Study Cutting Blades

- Cutting of plastic foil
- High content of TiO₂ (>10%)
- Highly Abrasive
- High Speed cutting (>200m/min)
- High precision

- **Life time :**

Steel blade:	3,000 m
TiN + steel blade:	16,000 m
WC blade:	150,000 m
Adm tm coated blade:	360,000 m



Benefits:

- \$\$ cost savings in reduced downtime
- Improved reliability ; less scrap
- Reduced running costs



Thank You

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