



Keronite PLC

European Energy Venture Fair

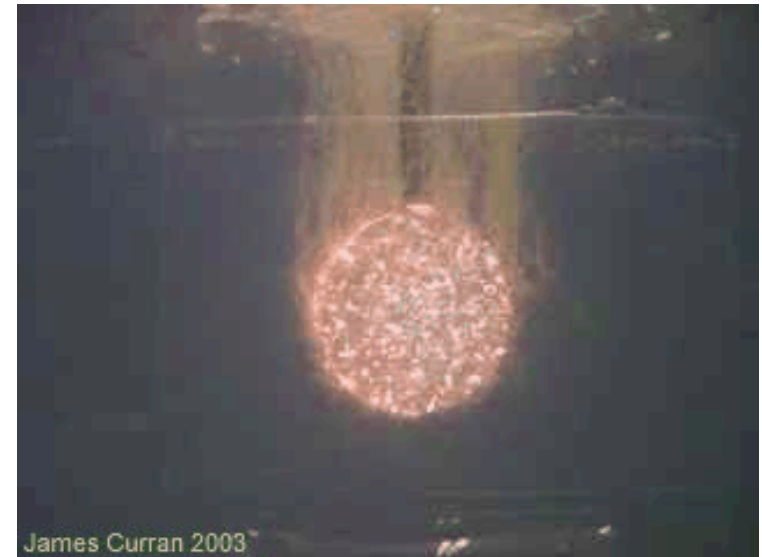
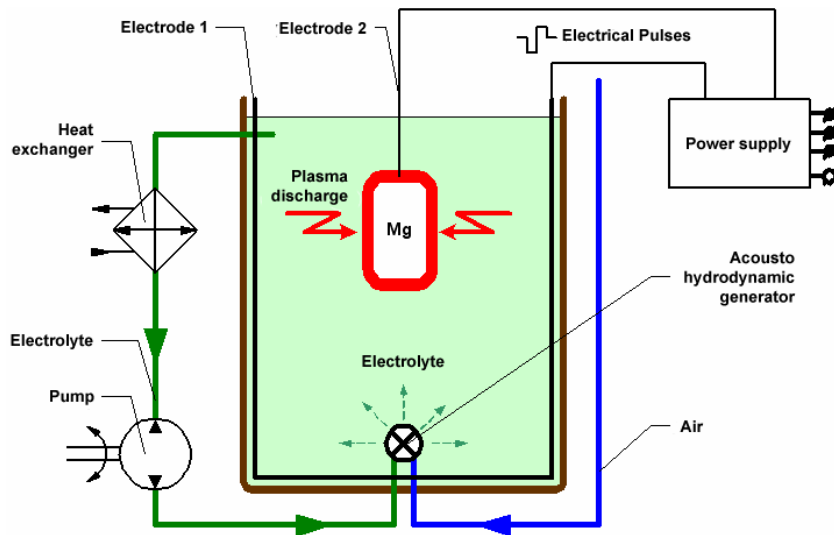
12.9.2006 - Zurich

Nick Kuenssberg

Chairman

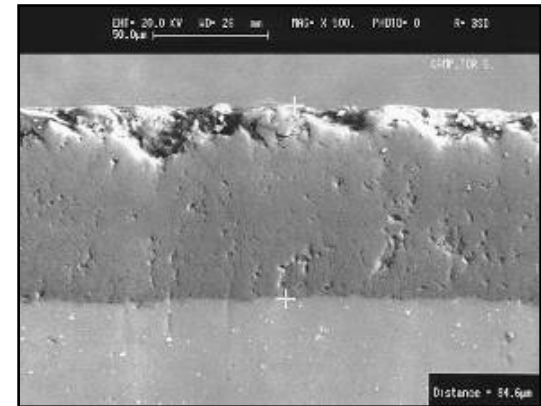


Keronite is a world leader in the provision of technology services, facilitating the reduction of costs & improved efficiency through the use of aluminium and magnesium

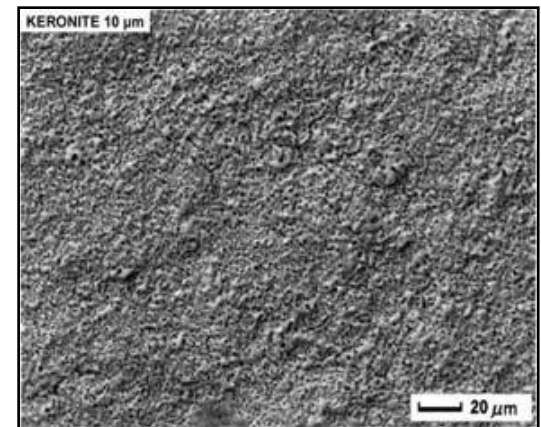


SOLUTIONS + APPLICATIONS + DELIVERY

- ❑ advanced surface treatment technology for aluminum and magnesium alloys
- ❑ a patented process known as Plasma Electrolytic Oxidation (PEO)
- ❑ a means of providing superior surface characteristics such as hardness, wear-resistance, corrosion-resistance and thermal insulation
- ❑ a process which transforms the surface of light alloys into a hard, dense ceramic oxide
- ❑ a user-friendly and non-toxic surface treatment technology
- ❑ an enabling technology, proven in a variety of industrial applications



Keronite cross section



Keronite surface

- ❑ enable customers to optimise aluminium and magnesium by working in partnership with their supply chain
- ❑ research and develop new applications to deliver cost reductions and/or efficiency improvements to customers
- ❑ drive the demand for new applications
- ❑ design and build fully commissioned hardware
- ❑ leverage the Company's expertise in electrolyte formulation
- ❑ optimise the business model





Keronite - the story to date

Take-Off

- 2005** Volume production of architectural panels
Sales representatives appointed to cover Germany, Spain, Italy, Portugal
BMW and GM approve Keronite
First leasing deals
- 2006** Generation III machine commissioned
First multi-million \$ installations for oil & gas and semiconductor industries in USA
European Space Agency approves Keronite
Keronite achieves ISO 9001 certification
Continued expansion into Asia with focus on Japan, China and South Korea
Rights issue and £10m pre-IPO placing

Development

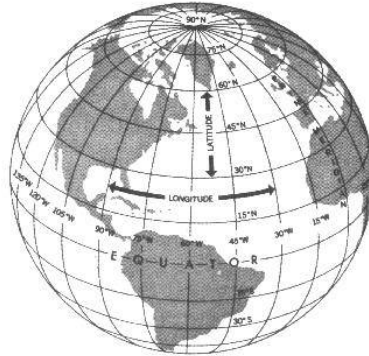
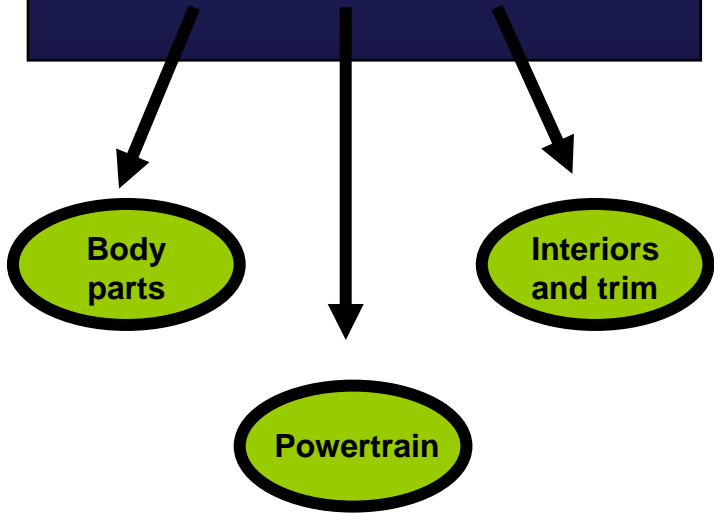
- 2002** Pilot plant established, Cambridge
- 2003** Licensees appointed in Spain, Italy, Taiwan, Singapore
- 2004** Further £0.75 m funding raised
Olrik appointed CEO
R & D partnership formed with Cambridge University
Partnership with Powdertech, UK
- 2005** Global network formed including Meridian, Timminco, Gramm, Dynacast and Thixomat
Move to leasing business model
Capital restructuring and £1.55m rights issue

Foundation

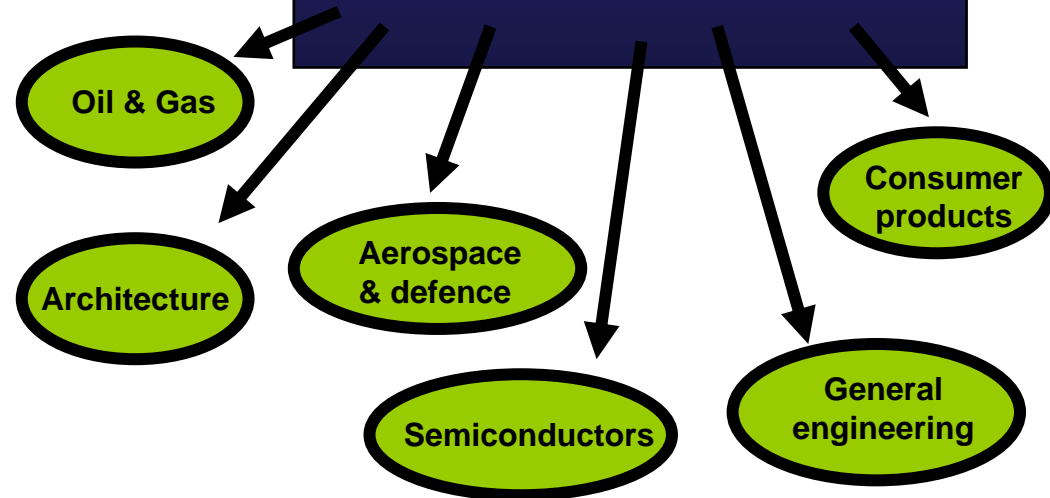
- 1980's** PEO developed in Russia
- 1998** Technology transferred to Isle of Man
Isle Coat Ltd established in Isle of Man
- 1999** First licensees appointed in UK and Italy
- 2000** Keronite Ltd established in Cambridge
Keronite acquires Isle Coat
£2.1 m fundraising
- 2001** Licensees appointed in UK, Germany, USA



Automotive



General Industrial





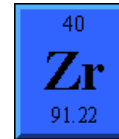
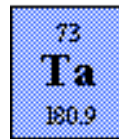
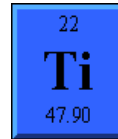
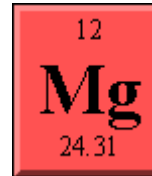
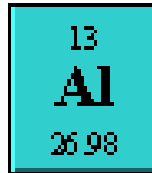
Allison Transmission
Division of General Motors

Characteristics of the product?



Aluminium

Magnesium



Fully recyclable



Keronite: enabling the wider use of light alloys



- ❑ Keronite facilitates the use of lighter alloys which leads to a reduction in fuel consumption and associated emissions.
- ❑ Keronite surfaces improve engine efficiency and reduce fuel consumption by reducing friction.
- ❑ Keronite coated alloys can be recycled at end-of-life.
- ❑ Keronite gives greater durability and offers the potential of repair rather than replacement of worn parts.
- ❑ Keronite improves efficiency by reducing the number of process steps and reject rates.
- ❑ AND Keronite process uses **NO** chrome, **NO** heavy metals, **NO** acids and generates **NO** hazardous waste.



Key benefits: *weight/emissions reduction*
performance enhancement

- general engine applications (*pistons, ring grooves, cylinders*)
- external body components (*front ends, bonnets, door frames*)
- interior and trim (*mirrors, seat runners, gear knobs*)





Overall weight savings achievable using **magnesium**:

Subsystem	Mass of components that could be replaced	Mass in magnesium	Mass saved
Powertrain	88	58	30
Chassis	80	35	45
Body	12	5	7
Interior	31	21	10
Total mass [kg]	211	119	92

According to US government sources, a 10% weight saving will yield a 7% reduction in fuel consumption.

Total emission of CO₂ produced by the U.S transport sector in 2004 was 1944 million tons.

Estimated weight saving of 100 kg for a car will lead to an increased fuel efficiency of about 4%.

Weight reduction through the use of Keronite treated magnesium could reduce CO₂ emissions of the U.S transport sector by 80 million tons p.a.



Aluminium piston crowns

- Keronite is resistant to detonation damage
- allows higher specific power and leaner burn
- reduces crown temperature
- Keronite can coat inside bowl of diesel pistons
- excellent adhesion
- does not crack or peel



Aluminium piston top ring grooves

- Keronite surface is very hard: 500-1000HV (c.f. hard anodising 300-350HV)
- five times less system wear than hard anodising
- reduced wear means lower emissions and blow-by
- allows smaller land height hence lower unburned HC emissions
- very thin layer – better cooling and cost competitive





Aluminium transmission plates

- Keronite used as thermal barrier, reducing gearbox temperature during endurance races





Magnesium gearbox casings

- approved for US military use
- Keronite + epoxy topcoat system prevents corrosion



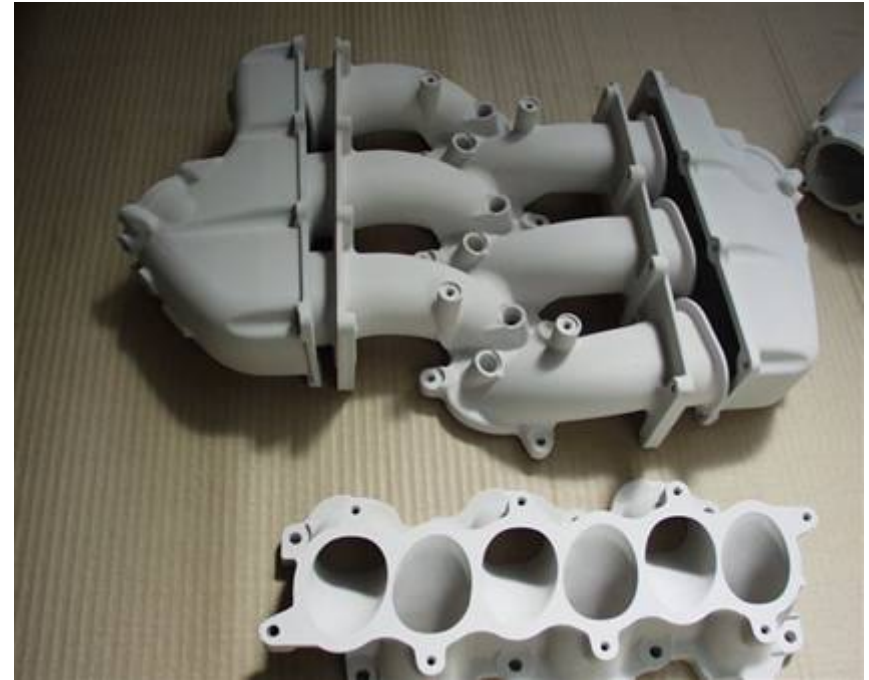
Allison Transmission
Division of General Motors





Performance V6 inlet manifold, plenums, rocker covers, timing chain cover in magnesium

- required high temperature alloy with inherent corrosion problems
- casting porosity: c50% reject rate
- Keronite was the only solution
- reject rate reduced to 3%
- e-coat used as cost effective aesthetic top coat





Magnesium race wheels

- wheels must be stripped for stress corrosion crack checking
- Keronite reduces corrosion
- can be crack-tested without stripping

Indy Pro Series Technical Bulletin 10-06, Feb. 8, 2006

2006 Indy Pro Series Rule Book, Appendix B, Technical specifications, Rule 108, Wheels reads, “The only approved wheel finish is Dow 9”. This will be changed to “The only approved wheel finish will be Keronite.” All Pro Series teams must have wheels coated with “Keronite Coating” by the Indy Open Test, April 27, 2006. Any team who purchases new Oz Wheels after January 1, 2006 will not be required to have the Keronite process done on those wheels until the 2007 season. Please contact Marti Humphrey at Keco Coatings for more information.

Thank You,
Butch Meyer
Pro Series Technical Director





Generation of renewable energy potential:-

- pressure chargers for fuel cells
- isolator rings for wind turbine generators
- solar panel architecture

