

# Securing The Future

The Role of Innovation in the Development of Bodycote  
as a Services Company

Presentation to the MPI Spring Symposium  
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# The Evolution of Bodycote



- 1923 - *George Bodycote* founded a textile manufacturing company
- 1972 - *Bodycote International* is formed
  - Bodycote owns 11 facilities in 3 countries
- 1979 - Bodycote begins its transition from a textiles to a materials service company
  - First heat treat company acquired (Blandburgh Ltd)
  - Bodycote owns 21 facilities in 3 countries
- 1980 - First coatings company acquired (Zinc Alloy Rustproofing Ltd)
- 1990 - First testing company (MTS Ltd, Edinburgh) acquired
  - Bodycote owns 40 facilities in 6 countries
- 1991 - First hot isostatic pressing companies purchased (HIP Ltd and Infutech Ltd)
  - Annual Metal Technology Sales = £27M
- 2006 - Continual growth, both organic and by acquisition, has resulted in a dramatic change in the nature of the corporation
  - Bodycote now operates over 300 facilities in 30 countries
  - Current annual sales of £470M ...a growth of 1600% since 1991

# The Evolution of Bodycote's Philosophy on Innovation

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Bodycote's Corporate approach toward technical innovation can be divided into three phases.

Phase I - 1990 and earlier – The Dark (unenlightened) Ages

Phase II - 1990 to 1998 – The Transitional Years

Phase III - 1998 to Present – The Age of Enlightenment

# The Evolution of Bodycote's Philosophy on Innovation



## Phase I - 1990 and earlier – The Dark (unenlightened) Ages

*A time without internal technical development.*

Corporate philosophy on innovation during that time:

***Enhance profitability by minimizing costs, maximizing productivity. Research and development is considered an unnecessary overhead cost.***

- In the early days Bodycote's UK heat treat and coating operations were devoid of research and development activities. Technically qualified personnel were employed in production management, quality management or technical sales.
- Innovation was driven by the equipment suppliers and the customer's requirement for product improvement. Investors did not value R&D

# The Evolution of Bodycote's Philosophy on Innovation



## Phase II - 1990 to 1998 – The Transitional Years

*A time characterized by disjointed technical development. Some companies that were purchased continued with existing technical programs after acquisition.*

- Several acquired companies continued 'guerrilla' r&D
  - Selected technical personnel were retained and given 'operational' roles
  - Funding was obtained from internal cash-flow.
  - Progressively, the Bodycote Group embraced new technologies and the expertise of its employees expanded accordingly
- Unfortunately, results were carefully 'guarded' within the profit center. From a corporate point of view, the effectiveness of the development effort was devalued. **Innovation stayed within those companies doing the development work.** There was no effort to disseminate the technology within the corporation.

# The Evolution of Bodycote's Philosophy on Innovation

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## Phase III - 1998 to Present – The Age of Enlightenment

*Corporate pursuit of coordinated, collaborative, programs focused on innovation.*

- As a global supplier of vital services to major customers, Bodycote is now expected to differentiate its services from those of its competitors. Investors now value R&D.
- Global market pressures and the 'commoditisation' of conventional thermal processing services has a negative impact on profit margins.
- A focused R&D program allows Bodycote to develop high tech, value added services. By providing advanced services, Bodycote can differentiate itself from the commodity service suppliers.

# Challenges



Having an enlightened philosophy is not sufficient for success. The objectives of that vision must be realized!

Creating and maintaining a focused, coordinated, cost effective, successful technical development program is a difficult task in any company. ...It is especially difficult in an international corporation, with a large number of small operational units.

# Challenges

## **How does an international corporation, with small units...**

- harness the creativity and imagination of a disparate, multinational workforce?
- encourage existing technical personnel and attract gifted candidates?
- fund and organise effective research and development activities in a service company?
- maximize its return on an R&D investment?
- leverage, jointly with customers, the opportunities for improvement of processes, products and service?
- secure, develop and retain intellectual property?
- drive technology transfer within the corporation?



## Challenges

- How does an international corporation drive technology transfer within the corporation?
- How does a company harness the creativity and imagination of a disparate, multinational workforce?
  - Factors such as cultural differences and physical distance present an obstacle to communication.
  - Lean staffing corresponds to busy schedules. Communication with international colleagues requires an extra effort.
  - Language barriers are an issue.

## Bodycote's Approach

- Establish a technical network that spans all levels of the organization. Meet or communicate at regular intervals. Demand the dissemination of information.
  - Requires commitment at all management levels

## Challenges

- How does a large corporation fund and organise an effective research and development program in a service company?

## Bodycote's Approach

- The drive must come from the top corporate level
- Some funding must come from the corporate level
  - advantages in cost sharing
- Skilled staff must manage these programs
  - requires both advanced technical knowledge and business/shop floor 'savvy'
- All levels of management must be on board
  - requires marketing and communication on the part of technical leaders

## Challenges

- How does a corporation encourage existing technical personnel and attract gifted candidates?

## Bodycote's Approach

- Promote continued education of its employees
- Encourage university students who pursue relevant technical fields
  - The Bodycote Education Foundation
- Promote interactions with universities
  - Employ students as technical interns
  - Collaborate with universities on research projects when appropriate

# The Bodycote Educational Foundation



- A program established in 1996 to strengthen the relationship between Bodycote and academia.
  - This program encourages and supports students pursuing degrees in disciplines related to Bodycote technologies by means of an annual prize paper competition and through funded internships.
  - In the last 10 years the Bodycote Prize Paper Competition has awarded cash prizes totalling \$62,400.
  - The paper competition provides an opportunity for managers to assess high quality engineering students. Since 1996 ten finalists of the paper competition have joined Bodycote.
  - The foundation also funds student internships within Bodycote companies. Projects are relevant to their studies and of value to Bodycote. The B.E.F. has arranged and funded over 100 student placements in 8 countries.
  - Interaction with Universities enhances the image of Bodycote within the academic, industrial and financial communities.

## Challenges

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- How does a service company collaborate with its customers on opportunities for improvement of processes, products, and service?
- How does a service company leverage and retain intellectual property (IP) in its role as a service provider?

## Bodycote's Solution

- Form strategic partnerships with manufacturers, equipment suppliers, customers, end users.
- Understand and manage the IP boundaries

## Challenges

- How does a corporation maximize the return on its R&D investment?

## Bodycote's Solution

- Analyze and manage risk.
- Consider program review from both a technical viewpoint and with respect to potential profitability.

# Summary



- The objective of Bodycote's R&D effort is long term profitability.
- Bodycote's technical innovation is focused on our area of expertise, materials processing and testing.
- A company's approach to innovation depends upon the way it chooses to pursue a market.
- Innovation in a globally distributed company is a complex job, it requires a concerted effort to coordinate disparate groups and cultures.

- A successful innovation program involves managing risk. A poorly run R&D program can be a financial drain on a company.
- Successful R&D can result in significant financial benefit to a corporation by differentiating a company's services from the competition, and increasing margins.



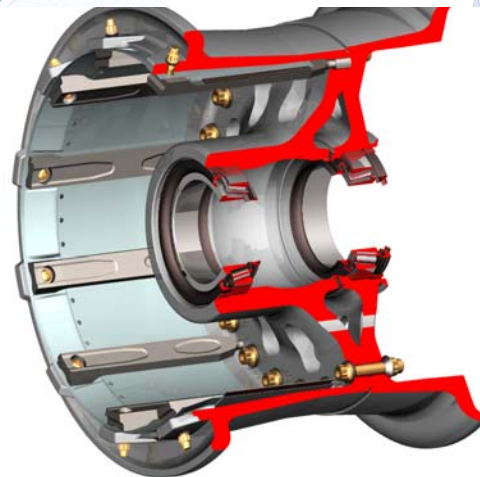
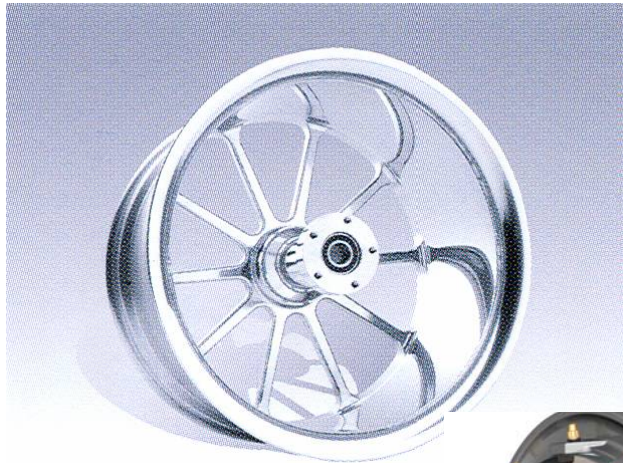
## Densal®

- Development of DENSAL® provides a cost effective and efficient HIP process for the densification of Al castings. Processing costs decrease, the aluminum HIP market expands to include automotive applications.
- Removal of porosity and improved X ray characteristics
- Improved ductility, fatigue life, impact toughness
- Decreased variation in mechanical properties
- Improved surface finish
- DENSAL® is an Airbus approved HIP process

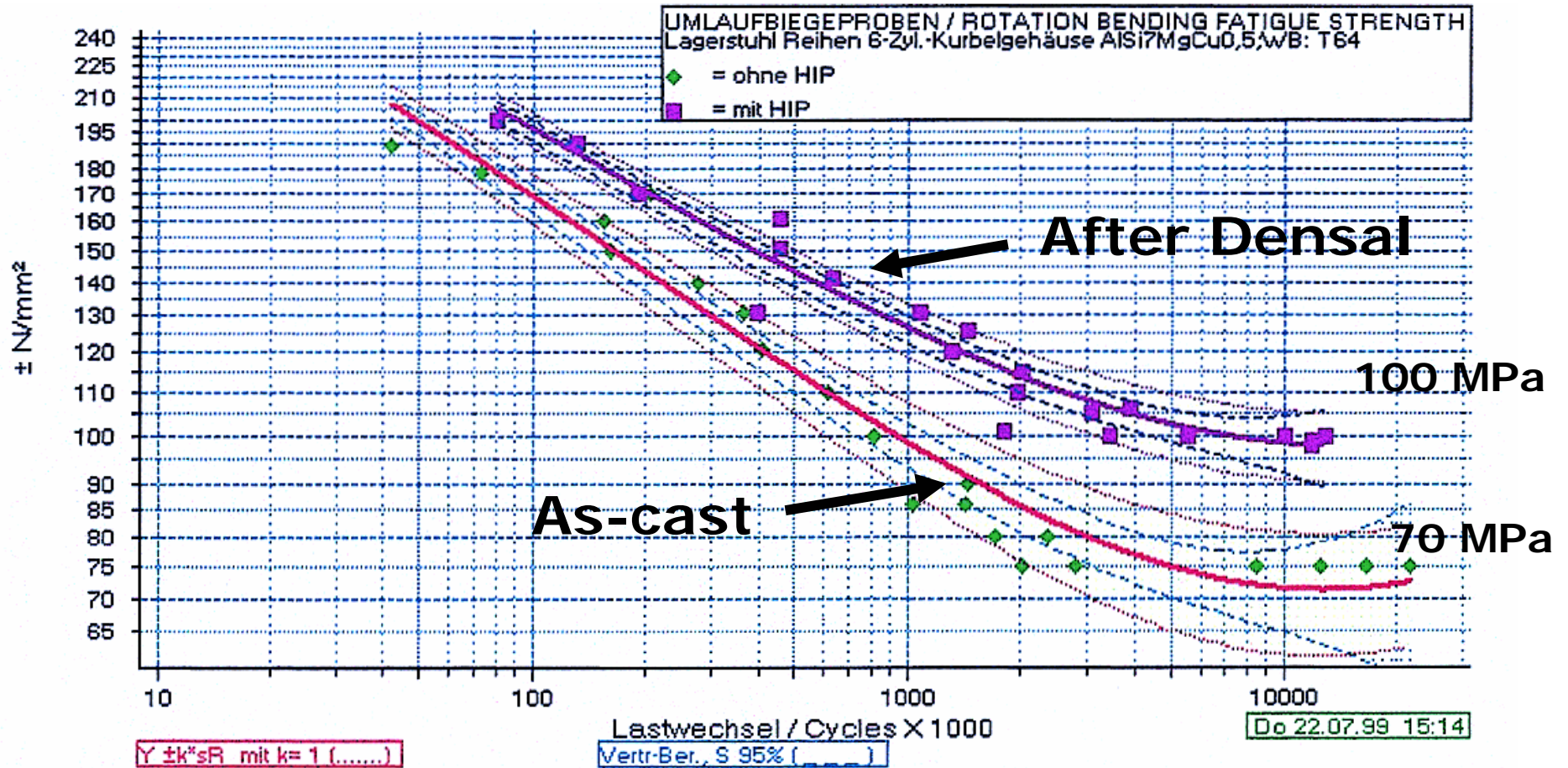


# Innovation - HIP Densal<sup>®</sup>

Application: fatigue critical aluminum castings. For example: motorcycle wheel



## Densal®



Fatigue Testing of gravity die cast engine block for automotive diesel engine.

# Innovation – Thermal Processing

## Corr-i-Dur<sup>®</sup>

A nitro-carburizing process, with post-process oxidation.

- **Brake Piston**
- **Weight Reduction**  
change material from cast iron to sheet steel – 25% weight reduction
- **Surface**  
Substitution of chrome plating
- **Requirements :** Corrosion resistance  
Wear resistance  
Surface roughness
- **Environmentally friendly process**



**Corr-I-Dur<sup>®</sup>**

**Chrome plated**



## Kolsterising<sup>®</sup>

Technology development transferred from the university to industry

Hardening austenitic stainless steel without reducing the corrosion resistance

- Austenitic stainless steel offers excellent corrosion resistance but poor wear properties and shows galling
- Conventional hardening processes, eg. Tufftride<sup>®</sup> or Malcomizing<sup>®</sup> reduce the corrosion resistance due to the formation of chromium carbides or nitrides
- Prof. Kolster invented a process to harden austenitic steel without the formation of precepitates
- Bodycote has developed the production scale process and now exclusively offers Kolsterising<sup>®</sup> internationally from 3 locations

# Innovation – Testing



## Process Development and Evaluation Tools -

High Temperature Coatings Laboratory

Cambridge, Ontario, Canada



**Bodycote**

