CLUSTERPLAST Kick-Off Meeting

Engineering & Tooling

(PORTUGAL - CLUSTER)
Topics

• Engineering & Tooling Cluster (Portugal)
  - Industry Dimensions
  - Facts & Figures
  - CLUSTERPLAST Members (Complementarity)
  - Tooling Strategy

• European Tooling Platform (*MANUFUTURE*)

• Project Expectations
Engineering & Tooling Cluster (Portugal)

Industry Dimensions

CEFAMOL
Market

CENTIMFE
RTD / Training

OPEN
Entrepreneurship

Municipality
Marinha Grande
Public Authority

IST Lisbon
University / Science

Lyon, 5-6 February 2009

WP Presentation-CLUSTERPLAST KO Meeting
Engineering & Tooling Cluster (Portugal)

* Product Development & Engineering
* CAD/CAM/CAE
* Rapid Manufacturing (PR/RT)
* Communication
* IT Security
* Knowledge Management
* Processes Reengineering
* High Speed Milling
* Micro-Manufacturing
* Management & Planning
* Quality, Environment, Health & Safety Work
* Metrology
* Jigs & Measurement Systems
* Reverse Engineering
* Plastics Injection
* Die Casting Tools
* PIM – Powder Injection Moulding
* Bi-Injection
* RIM-Reactive Injection Moulding
* In-Mould Assembling
* Gas injection;
**Engineering & Tooling Cluster (Portugal)**

### Tooling Companies

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<thead>
<tr>
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<tbody>
<tr>
<td>Leiria</td>
<td>91</td>
<td>107</td>
<td>18%</td>
</tr>
<tr>
<td>Marinha Grande</td>
<td>121</td>
<td>165</td>
<td>36%</td>
</tr>
<tr>
<td>Oliveira de Azeméis</td>
<td>50</td>
<td>66</td>
<td>32%</td>
</tr>
<tr>
<td>Resto do País</td>
<td>151</td>
<td>198</td>
<td>31%</td>
</tr>
<tr>
<td>Total</td>
<td>413</td>
<td>536</td>
<td>30%</td>
</tr>
</tbody>
</table>

### Human Resources

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<tr>
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</thead>
<tbody>
<tr>
<td>Leiria</td>
<td>1062</td>
<td>1179</td>
<td>11%</td>
</tr>
<tr>
<td>Marinha Grande</td>
<td>2169</td>
<td>2710</td>
<td>25%</td>
</tr>
<tr>
<td>Oliveira de Azeméis</td>
<td>1731</td>
<td>2197</td>
<td>27%</td>
</tr>
<tr>
<td>Resto do País</td>
<td>1749</td>
<td>2283</td>
<td>31%</td>
</tr>
<tr>
<td>Total</td>
<td>6711</td>
<td>8369</td>
<td>25%</td>
</tr>
</tbody>
</table>

**Portuguese Tooling Companies - Dimension**

**Facts & Figures**

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CEFAMOL (www.cefamol.pt)

- The Portuguese Tooling Association, CEFAMOL has been founded in 1969;
- Located at Marinha Grande, CEFAMOL has 120 members, which represent more than 90% of the Tooling production in Portugal;
- CEFAMOL holds the presidency of Pool-Net - Portuguese Tooling Network;
- Promotes the Industry at International markets;
CENTIMFE (www.centimfe.com)

- Founded in 1991, CENTIMFE, is a Non-Profit Private Organization (recognized by the Portuguese Government as a Public Utility Institution) to promote RTD, Specialized Training, Consultancy to the Industry;

- Associated organizations:
  - 226 Industrial Companies;
  - Public Organizations (IAPMEI, IPQ, INETI, Marinha Grande City Council, Batalha City Council, Leiria City Council, Oliveira de Azeméis City Council);

- Industrial Associations:
  - CEFAMOL - The Portuguese Association for the Moulds Industry;
  - APIP - The Portuguese Association for the Plastics Industries

- CENTIMFE holds the vice-presidency of Pool-Net and is a member of the Board of Directors of RECET - The Portuguese Technological Centers Association;
OPEN (www.open.pt)

- OPEN is a private Incubator Center, founded in 2004 to support the industrial entrepreneurship in Portugal;

- Located at Marinha Grande, OPEN has 57 members, involving SMEs, Municipalities and Industrial Associations;

- OPEN has created the OPEN Business Angels to support new Entrepreneurs & Businesses;

- OPEN is a member of RIERC - The Innovation & Entrepreneurship from Center of Portugal,
IST LISBON (www.ist.utl.pt)

- IST is a Higher Education Institution, in the areas of Engineering, Science & Technology, having more than 10,000 Students, being the largest Engineering School in Portugal. IST is a member of Pool-Net and an associate of OPEN Incubator, promoting academic spin-offs and evaluating entrepreneurship proposals;

- IST co-operates actively with the Engineering & Tooling Cluster. Being a key partner in several RTD projects (like EuroTooling 21), technological Missions and in several Industry’s activities, it also promotes studies and PhD Thesis in domains of central relevance to the Industry, in an active interaction involving Industry and Academy;

- IST is participating in the NMP working group within the umbrella of DG Research, in straight articulation with the Portuguese Tooling Industry;

“(…) Today, IST is recognized for its high quality education and R&D, in a growing synergy with the economic sector. IST is considered, in Portugal, and abroad, as a High Quality Engineering, Science and Technology School, which is able to rival with the best Schools worldwide, in their areas of competence”. Carlos Matos Ferreira - The Dean of Instituto Superior Técnico
Municipality of Marinha Grande (www.cm-mgrande.pt)

- Marinha Grande Municipality is an example of co-operation, between Public Authorities and Industry, being a Founding Member of CENTIMFE and OPEN;

- Marinha Grande Municipality has been a partner of the Tooling Industry, promoting several projects and initiatives like Marinha Grande Digital City, Leiria Digital Region, Moulds Event Weeks, Entrepreneurship Weeks, and recently (2008) the “Jornadas Económicas”, an Economic & Social Forum held in this Region, involving all stakeholders in order to discuss and establish priorities to address to the emergent and future challenges being posed to this Community;

- In address to European priorities, Marinha Grande Municipality has been promoting several projects (e.g. Territorial Pact for Employment), to support the Regional Industry (specially the Tooling & the Glass Industries), creating economic links and complementary Instruments for sustainability & competitiveness.
Engineering & Tooling Cluster (Portugal)

Tooling Strategy

- Energy & Environment
- Electronics
- Automobile
- Aeronautics
- Packaging
- Health

Pool-net - Portuguese Tooling Net

- CENTIMFE
  - Innovation & Intelligence
- Helpdesk
- CEFAMOL
  - Market

- Management & co-ordination Of the Cluster

- Tooling Companies;
- Industrial Associations;
- Technological Center;
- Training Centers;
- R&D Centers;
- Universities;
- Polytechnic;

- 80 % Portuguese Tooling Production

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Engineering & Tooling Cluster (Portugal)

Strategy

ASSOCIATIONS
RTD Organizations
COMPANIES

Network & Partnership

Management & Co-ordination
Helpdesk

Scientific Committee
Strategic Committee

Projects

Key Projects
Engineering & Tooling from Portugal
IDT for Tooling

Other Projects
LEAN_Tooling
Mobilizador HSM
Eco_Tooling
ReFRA
Formação, Qualificação e Inserção de RH
Mobilizador MM Tooling
Tooling_Push
DI_Markets
Pool.net - Co-ordination & Animation

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The Tooling Industry (moulds, dies and special tools) in Europe represents an average annual turnover of 13 Billion USD and comprises more than 7,000 companies, being 95% of them SMEs, representing a high added value workforce (more than 100,000 workers directly in the sector) with a remarkable know-how in design and manufacturing processes.

Tooling Industry is a knowledge-based Industry, being capital and Knowledge Intensive, supported on Innovation and global Co-opetition;

Moulds, Dies and Tools, are present in the design and manufacturing of almost all industrial products from aeronautics and automotive, to electronics, household, equipment goods and micro-devices.

MANUFUTURE Platform promoted a specialised working Group on Tooling to help on the development of a new paradigm for the European Industry and, recently, formally recognized the European Tooling Platform as a new MANUFUTURE sub-platform;
The Tooling Industry: Building a Network

Mouldforce
SMARTSKETCHES
OPTIMOULD
Round the Clock
IMATECH
HISIM
1998

SAFEWORK
INOCOP
ECOVIA
HIPERMOULDING
eSeSME
PALMIBER
Ch@tmould
SIMETRIA
PTI
e-Learning Hybrid Mould
SKISOFOT
TRAAAP
INTPLASTIC
Rapid Design

Clusterplast
TPSS
ENER-PLAST
EUROTOOLING 21

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# The European Tooling Road-Maps

<table>
<thead>
<tr>
<th>Sector 1.3</th>
<th>MANUFACTURE OF MOLDS AND SPECIAL TOOLS</th>
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<tbody>
<tr>
<td><strong>Small</strong></td>
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<tr>
<td>1. Business models and tools for maximize value creation over the lifecycle and for diversification</td>
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<tr>
<td>2. Tools for vertical integration</td>
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<tr>
<td>3. Networked business models and tools for efficient networking, digital business &amp; easy and economic communication</td>
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<tr>
<td>4. Simulation methods and tools for knowledge services (accurate prediction of dimensions and mechanical properties of moulded products)</td>
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<tr>
<td>5. Rapid manufacturing, small series and prototyping</td>
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<tr>
<td>6. New design and engineering techniques for intelligent moulds and tools</td>
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<tr>
<td>7. Advanced RPA components and IOT for intelligent moulds and special tools</td>
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<tr>
<td>8. Moulds for high output production of structural composites</td>
<td></td>
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<tr>
<td>9. Advanced automation and remote control</td>
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<tr>
<td><strong>Medium</strong></td>
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<tr>
<td>10. Coating and surface technologies (for special characteristics and sub-micron surface finishing)</td>
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<tr>
<td>11. Advanced technologies for micro tools and for surface finishing</td>
<td></td>
</tr>
<tr>
<td>12. Special moulding tools for functional materials</td>
<td></td>
</tr>
<tr>
<td>13. Innovative raw material for special applications (tools and products)</td>
<td></td>
</tr>
<tr>
<td>14. Moulds for non-conventional techniques (multi-material, in-mould assembly, fluid assisted, vibration assisted)</td>
<td></td>
</tr>
<tr>
<td>15. Micro moulding, micro assembling and clean room manufacturing</td>
<td></td>
</tr>
<tr>
<td>16. Welding technologies in tools construction</td>
<td></td>
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</tbody>
</table>

| **Large** |
| 17. Coating and surface technologies (for special characteristics and sub-micron surface finishing) |
| 18. Advanced technologies for micro tools and for surface finishing |
| 19. Special moulding tools for functional materials |
| 20. Innovative raw material for special applications (tools and products) |
| 21. Moulds for non-conventional techniques (multi-material, in-mould assembly, fluid assisted, vibration assisted) |
| 22. Micro moulding, micro assembling and clean room manufacturing |
| 23. Welding technologies in tools construction |

**1-2 years**

**2-4 Years**

**4+ years**

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Project Expectations

- Identification of complementarities within the European Industry (*Networking*);
- Share Industrial Best Practices;
- Establish new Activities and RTD Projects across the Europe;
- Creating and promoting new instruments to support the European Industry;
- Promoting European Mobility & European Industrial Knowledge;
- Initiate a coordination of RTD activities in the field of *Polymer Converting Industry* in Europe;
- Articulation with the MANUFUTURE strategy;
- Support new policies for the development of the European Industry Competitiveness;
Engineering & Tooling Cluster (Portugal)

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