

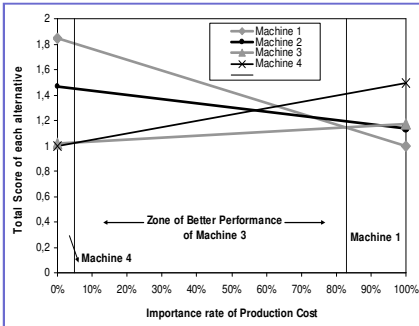
# A Roadmap to the Implementation of Life Cycle Approach in the Design of Plastic Injection Moulds

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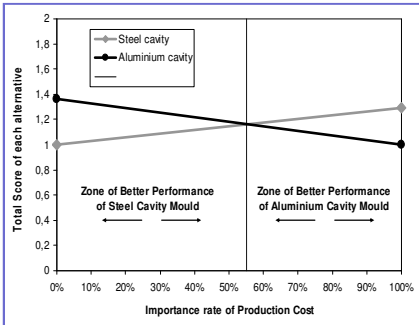
## Abstract

Life Cycle Engineering (LCE) is an approach to engineering activities which has enlarged more and more its application domain in the engineering design field. The basic idea is to make compatible in the same product or system the excellence of technical/functional performance, the economical viability and environmental sustainability. All of this considering an entire life cycle perspective. However, small and medium sized companies involved in the design of products and systems, and mould makers in particular, although have strong potential benefits in the implementation of LCE, have also strong barriers in the assimilation of the new concepts and procedures involved. This document focuses this controversy in the design process of plastic injection moulds defining and describing a Roadmap to the implementation of life cycle approaches and LCE design procedures into the mould making industry. The strategy proposed presents a step by step route, progressively combining functional, economic and environmental analysis in a life cycle framework to support the decision-making process. Moreover, several case studies are also presented to illustrate the proposed Roadmap.

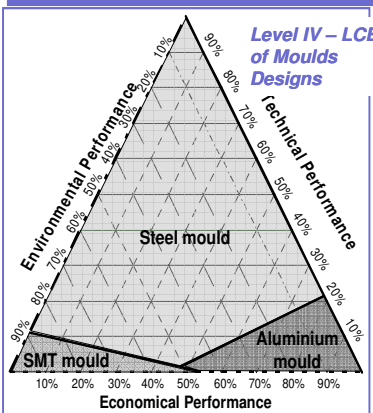
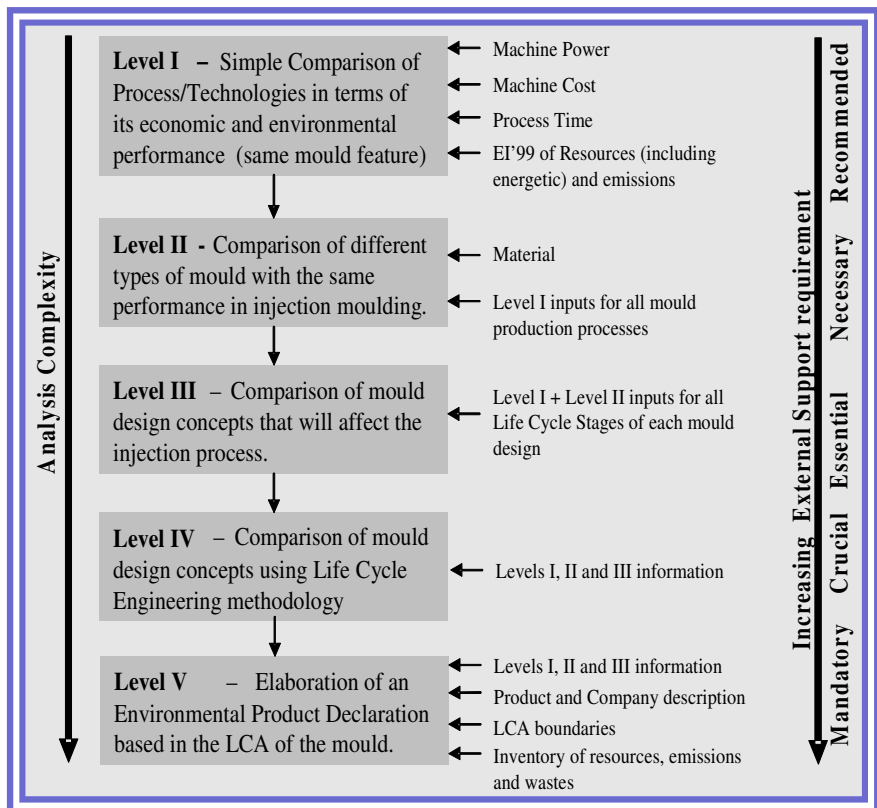
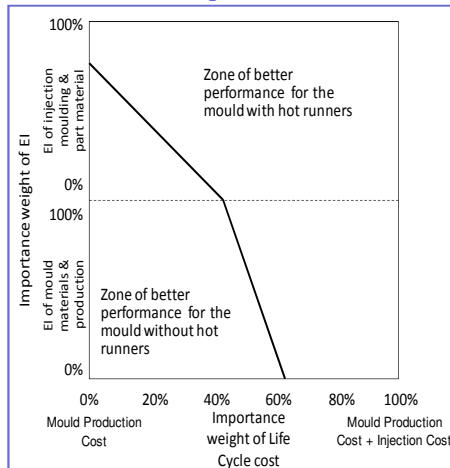
### Level I – Equipment Performance



### Level II – Mould Type Performance



### Level III – Mould Design Performance



Inventory parameters	Material Production	Mould Production	End of Life
<b>Resources</b>			
Resource, non-renewable (kg)	1097.82	0.01	0.10
Resource, renewable (kg)	61290.35	0	0.67
Resource, recycled (kg)	53.14	0	354.28
Energy resource, non-renewable (kWh)	173363.13	17595.42	8954.74
Energy resource, renewable (kWh)	36859.24	2926.24	0
<b>EI category indicators</b>			
Global warming (kg CO2 equivalents)	4757.44	0.01	0.01
Photochem.oxidants formation (kg POCP equivalents)	0.30	0.68	0.57
Eutrophication (kg O2)	0.79	0.05	0.10
Acidification (mol H+)	27.86	0.01	7.90
Ozone Depletion (kg CFC 11)	0	0	0
<b>Waste</b>			
Waste, hazardous (kg)	0.01	0	0
Waste, other (kg)	360.06	0	69.76
Waste to recycling (kg)	399.27	0	0.01

### Level V – Environmental Product Declaration