Rapid Tooling Techniques for the Die-Casting Industry

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Overview

- Rapid tooling process's
  - Laminate tooling
  - laser sintering
  - Wiba process
- Advantages over current tooling techniques
  - Conformal cooling
  - Shorter cycle times
  - Reduction / elimination of design constraints
- Research and future technology…….

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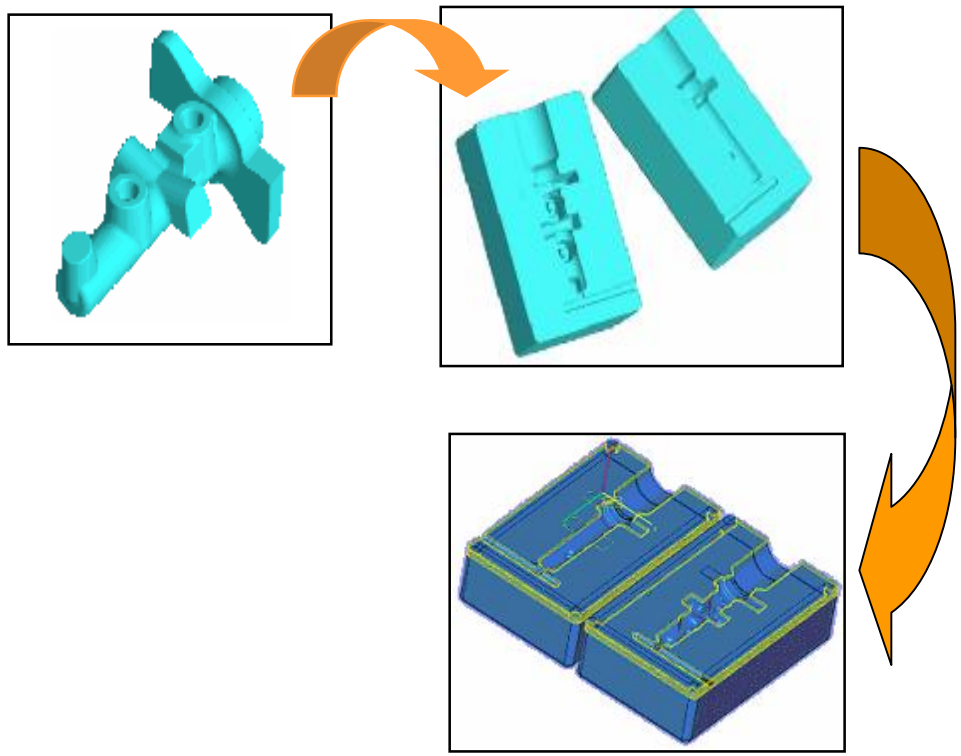
Rapid Tooling Process's

- Additive method of tool manufacture.
- 3D stl CAD file of the component required.
- 3D stl CAD file of the die halves created from the component file.
- Files sliced producing the layer by layer building data.



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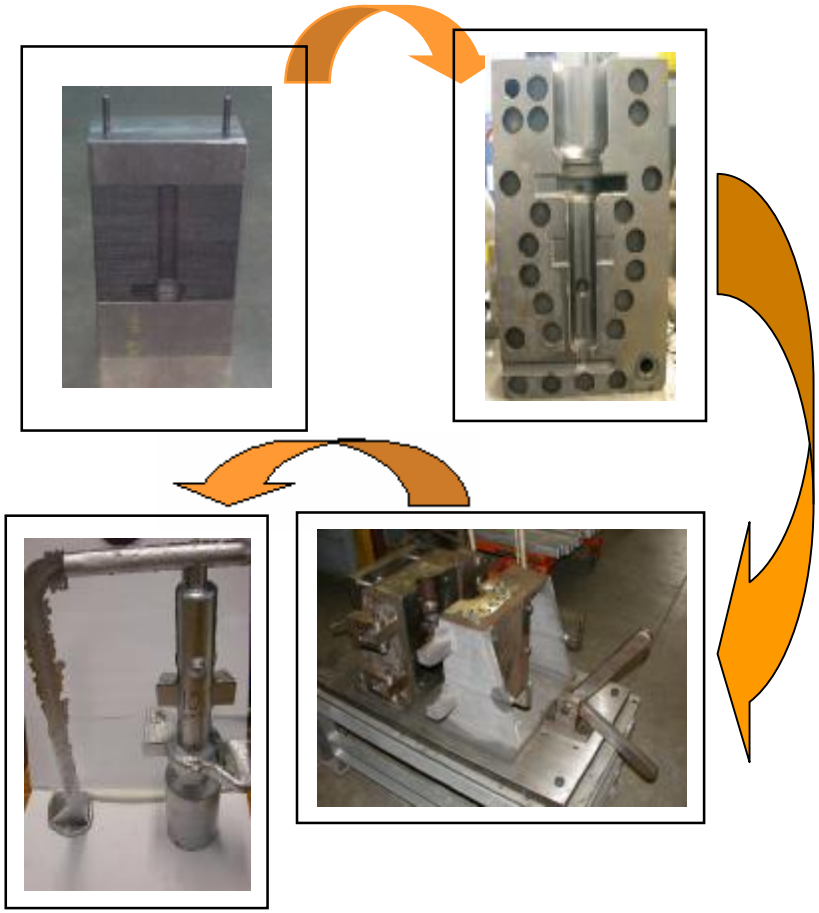
Laminate Tooling

- Laminated tools are produced by laser cutting H13 sheet steel.
- Bolted or braze bonded together.
- Dies are finished by either high speed machining or electrical discharge machining.



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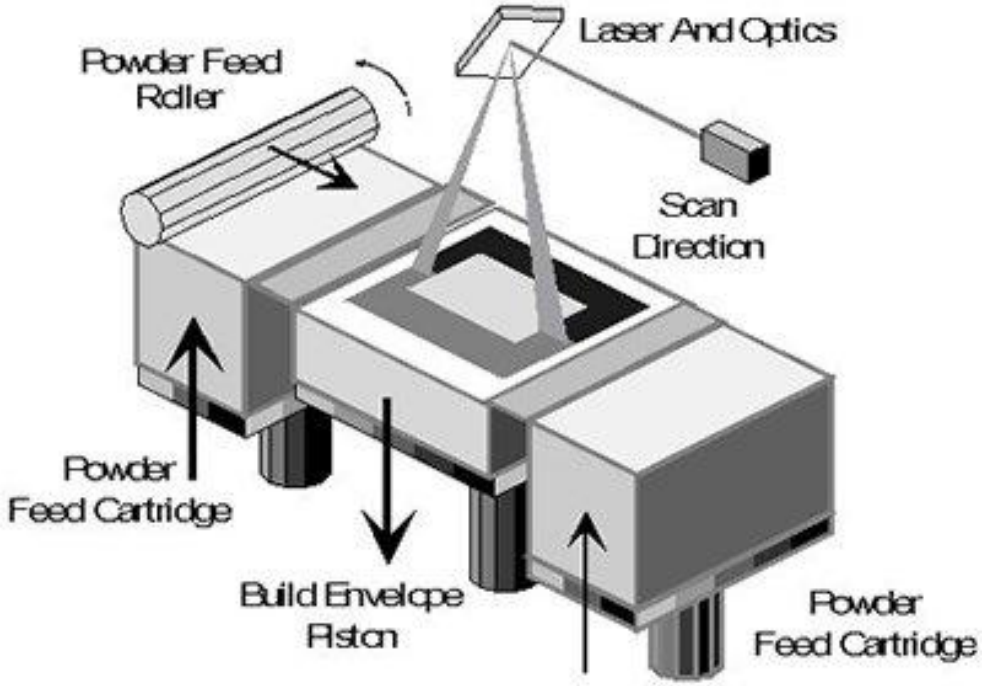
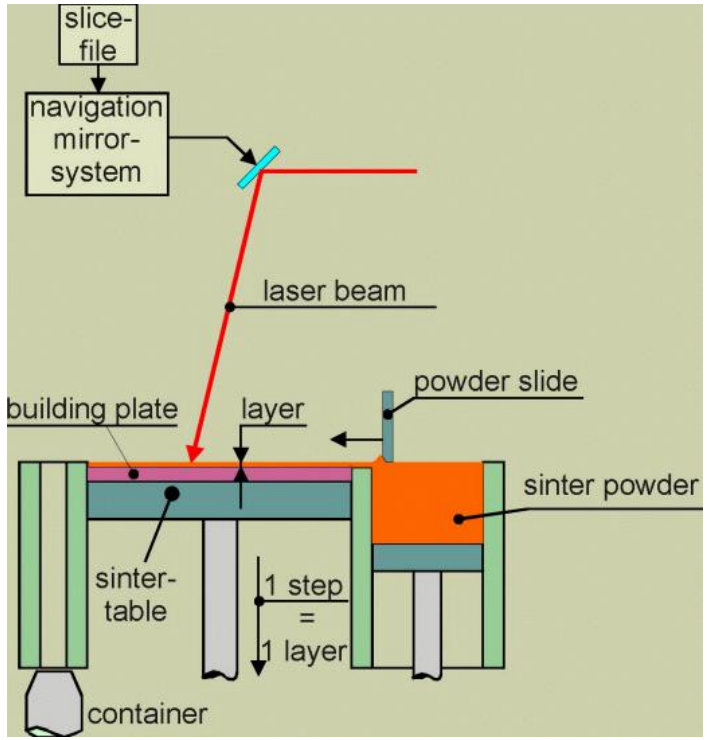
Laser Sintering (LS)

- Methods used to manufacture inserts



Selective Laser Sintering



Direct Metal Laser Sintering

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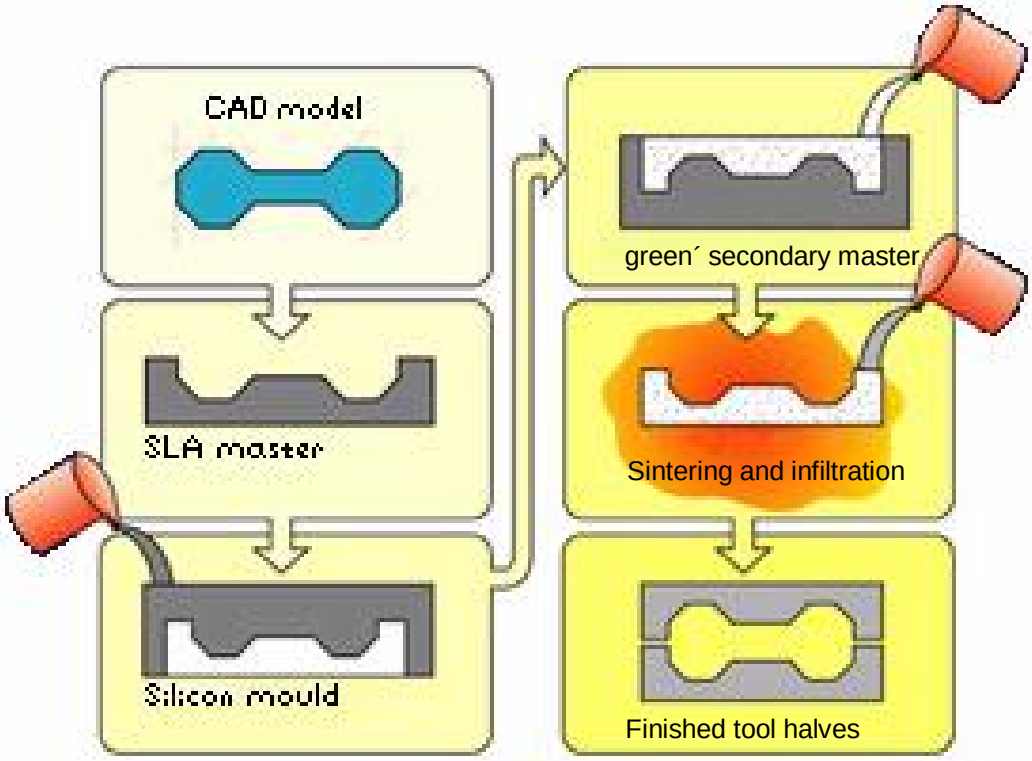
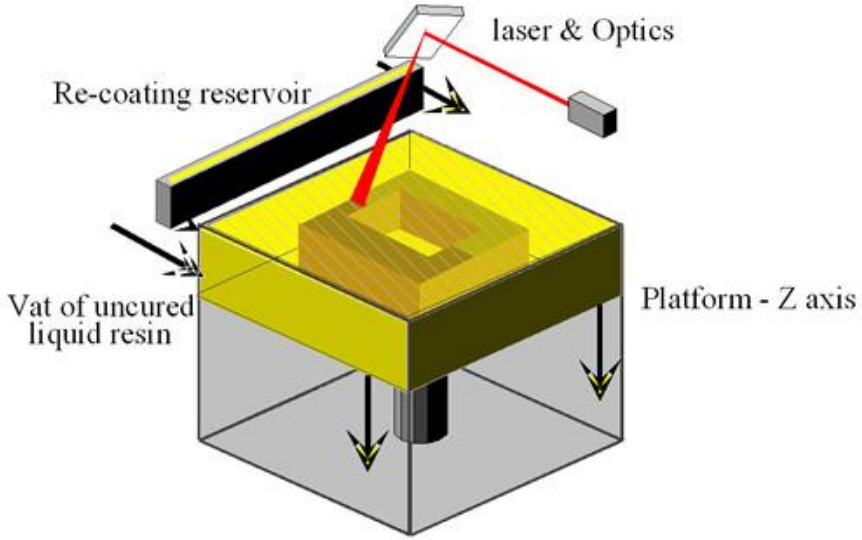
Wiba tool (Metal Copy)



Wiba Process



SLA Process

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Advantages Over Current Tooling Techniques

- Greater control and uniform die temperatures achievable
- Faster solidification rates
- Improved productivity
- Less constraints on tool and component geometry
- Die design validation
- Component can be tested for functionality

Research

- Aluminium (LM24) clutch housing die provided by Dyson & Kemlows Diecasting Products Ltd
- Tool ran on a Frech 125 DAK SDV cold chamber die-casting machine