Enabling Metalcasting as a Process Option at the Conceptual Design Phase

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Need and Industrial Relevance

Metalcastings are often best mfg. option
Must be considered during design
Need to avoid designer information overload

Research Thrust Area:

*Materials and manufacturing processes*
Project Goals

- Reduce overall design and procurement costs by increasing the use of metalcastings
Objectives

- Identify key design characteristics that eliminate or enable metalcastings
- Prioritize those characteristics that need to be addressed at conceptual design phase
- Develop e-design methods for identifying metalcasting design issues
Approach and Methods

- Determine key design characteristics
  - Directional solidification
  - Feeding length
  - Quality requirements
  - Tooling needs
- Interview experienced designers
- Evaluate effectiveness
- Incorporate into e-design tools
Outcome/Deliverables

- **Design characteristics** with priority to be considered at the design
- **Software tools**
  - provides designer with concise and relevant information on castability during early design phases
Impact

- Enable metalcasting as an option
- Eliminate need for redesigns
- Allow for more innovative component designs

Source: Modern Castings
Project Duration & Proposed Budget

- **Task 1**: Catalog design characteristics that make it feasible/infeasible as a casting
  - 6 months
- **Task 2**: Prioritize characteristics based on need at conceptual design stages
  - 7 months
- **Task 3**: e-design tools and testing
  - 11 months
- **$216,000**: 2 graduate students + travel