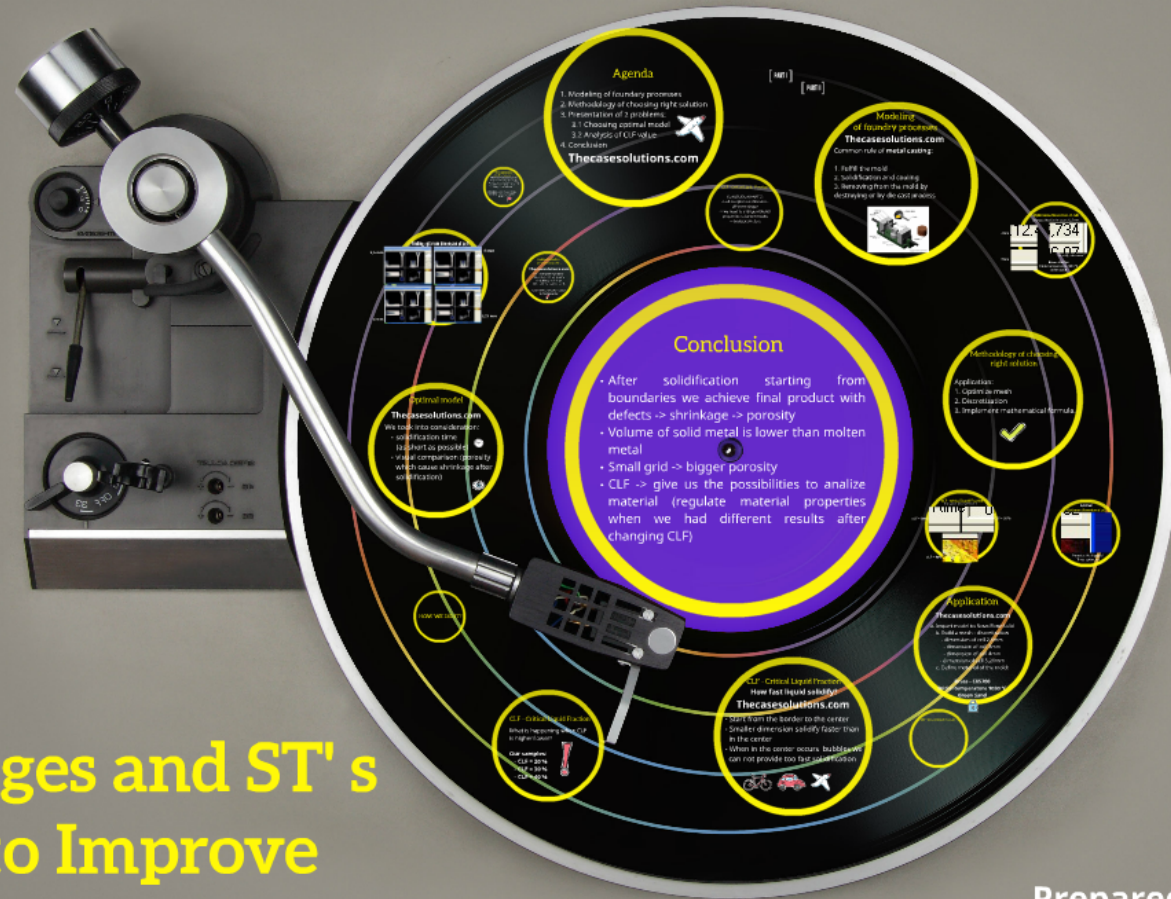


Operational Challenges and ST's Proposed Solutions to Improve Collaboration between IP and R&D in Innovation Processes

Prepared by:
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Agenda

1. Modeling of foundary processes
2. Methodology of choosing right solution
3. Presentation of 2 problems:
 - 3.1 Choosing optimal model
 - 3.2 Analysis of CLF value
4. Conclusion



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of cells.
500k

CLF - Critical Liquid F

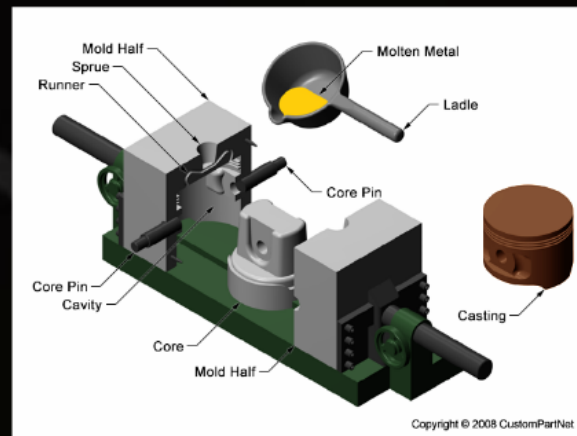
CONLSUSION PAR
-> all samples are dif
different shape

Modeling of foundry processes

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Common rule of **metal casting**:

1. Fulfill the mold
2. Solidification and cooling
3. Removing from the mold by destroying or by die cast process



4 mm

3 mm

Application

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- a. Import model to Nova Flow Solid
- b. Build a mesh - discretization
 - dimension of cell 2,5mm
 - dimension of cell 3mm
 - dimension of cell 4mm
 - dimension of cell 5,21mm
- c. Define material of the mold:

Brass - C85700

Initial temperature 1030 °C

Green Sand



Why dimension of cell is important?

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Decrease dimension of cell:

- > total number of cell is higher
- > calculation time will be higher
- > change quality of mesh



- **4 mm** gives us around 600k of cells.

- **2,5 mm** gives us around 2500k
of cells.



Optimal number
of dimension cells

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We need **lower number** of
dimension cells. We want to
find defects, with high
dimension we can not see it.

**Low number of cells - easier
to find porosity.**



Optimal model

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We took into consideration:

- solidification time
(as short as possible)
- visual comparison (porosity
which cause shrinkage after
solidification)



CLF - Critical Liquid Fraction

How fast liquid solidify?

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- Start from the border to the center
- Smaller dimension solidify faster than in the center
- When in the center occurs bubbles we can not provide too fast solidification

