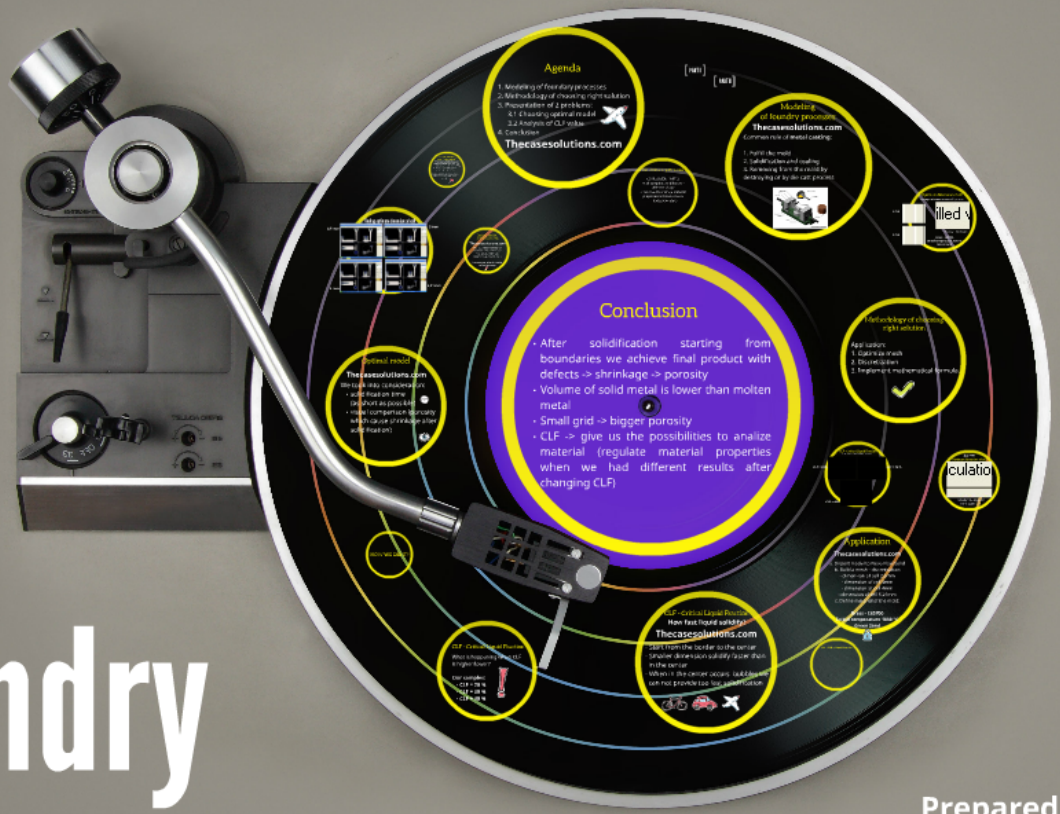
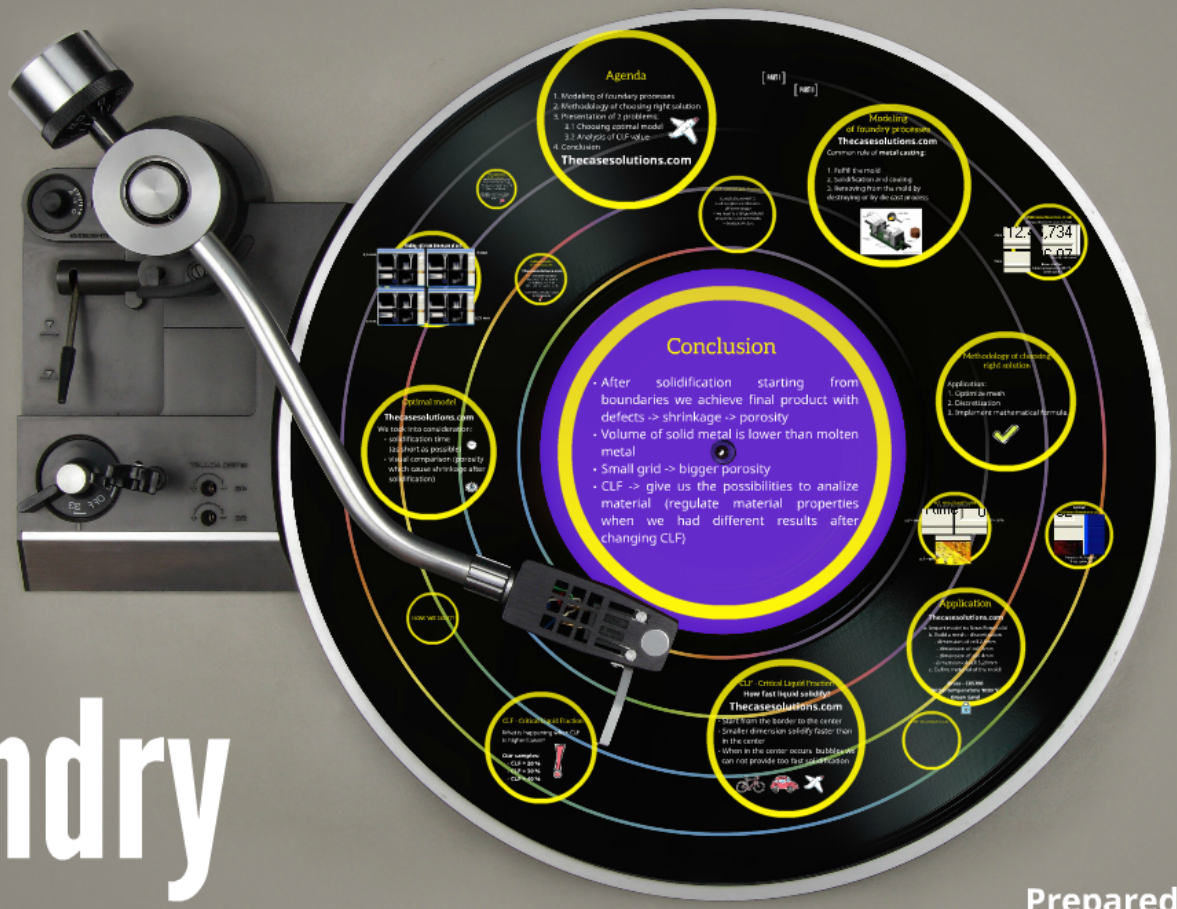


TONA Foundry

Thecasesolutions.com

Prepared by:
Adriana Kuna
Ewelina Kuśmider
MD-IE-32



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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

CLF - Critical Liquid F

CONLSUSION PAR
-> all samples are dif
different shape

Modeling of foundry processes

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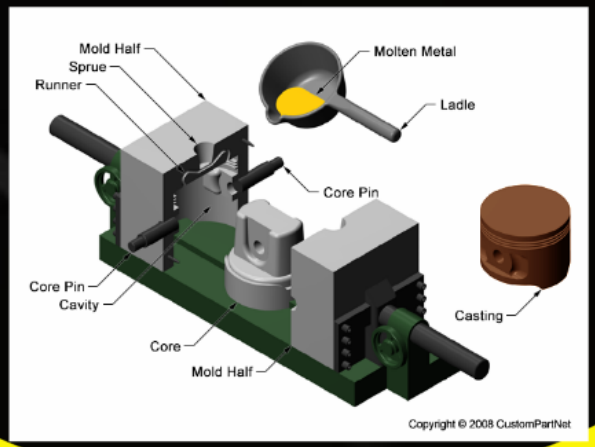
Common rule of **metal casting**:

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