

MAGMA

International MAGMA User Meeting 2024

October 9-11, 2024

RADISSON BLU – Frankfurt

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PART
OF
IT

The logo for MAGMA, featuring the word "MAGMA" in a bold, sans-serif font. The letter "G" is stylized with a red circular element around it.

About the Importance of Process Knowledge

Workshop Core Making Processes

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Frankfurt, October 10th 2024

International MAGMA User Meeting 2024

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Content

- Introduction
- Vertical Shooting / Curing
- The Challenge
- The Training
- The Result

Introduction

Target

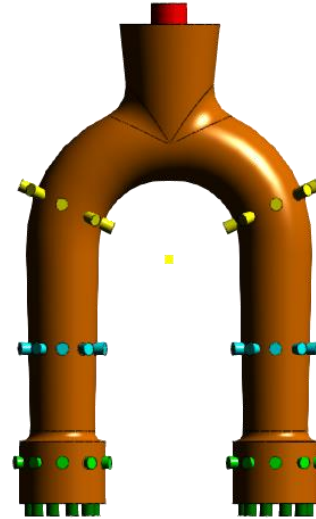
- ▮ Develop skills
- ▮ Understand Physics
- ▮ Practical understanding



Vertical Shooting / Curing

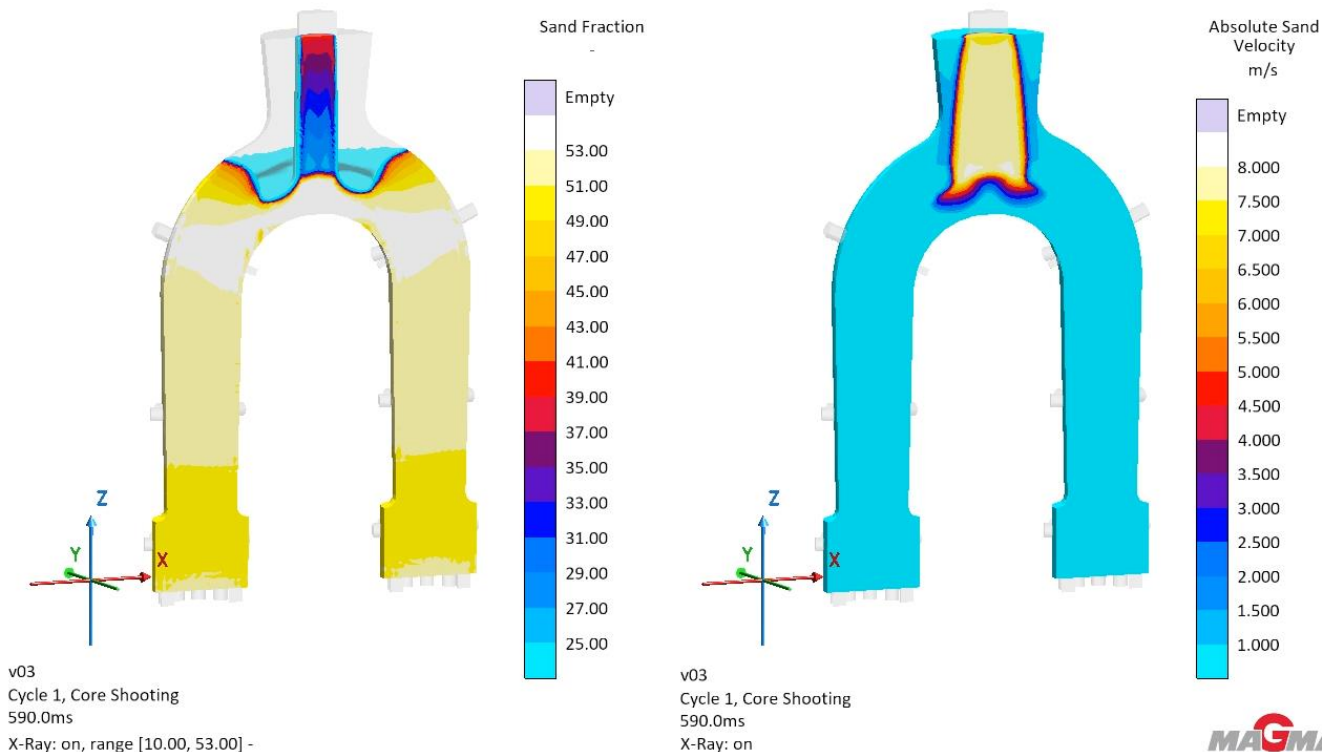
“Normal” Situation

- Usually shooting is not a problem
- Gassing is a challenge:
 - Gas has problems to reach the lowest point because vents are positioned excessively on way to the bottom



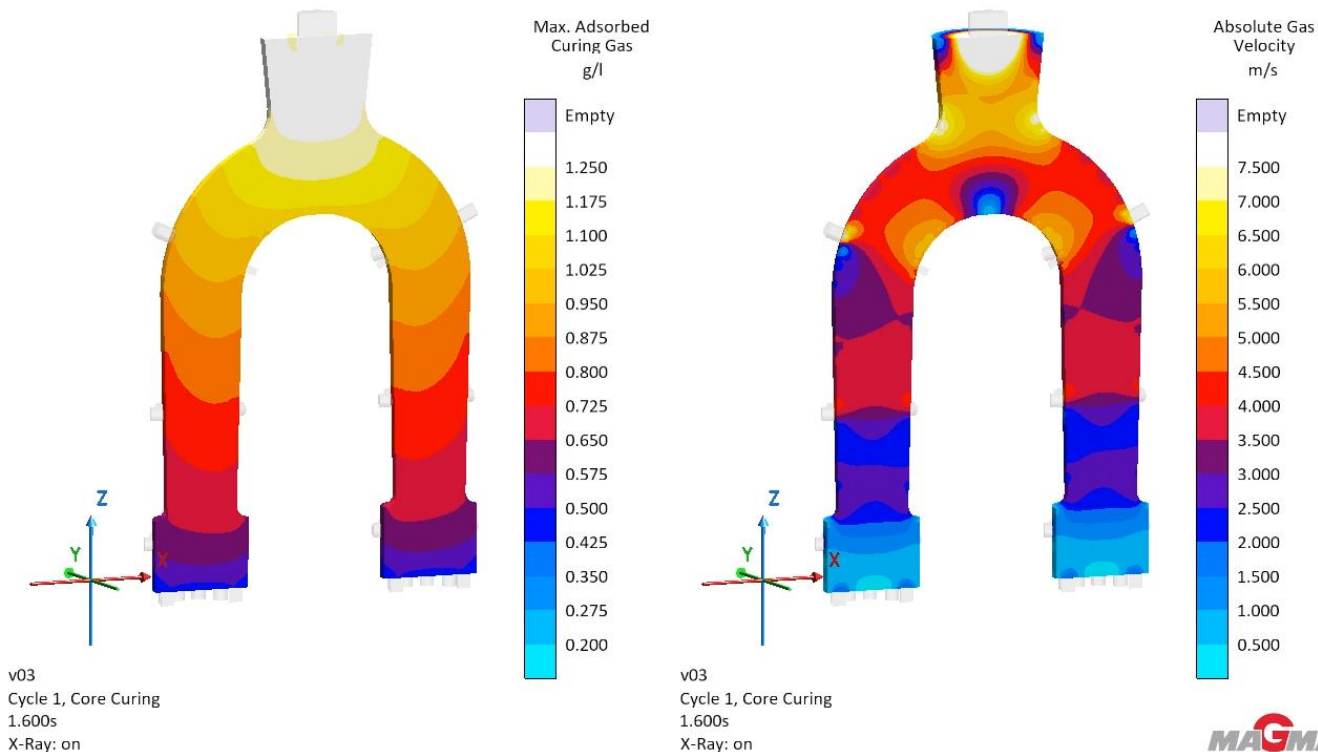
Vertical Shooting / Curing

Shooting – “Traditional”



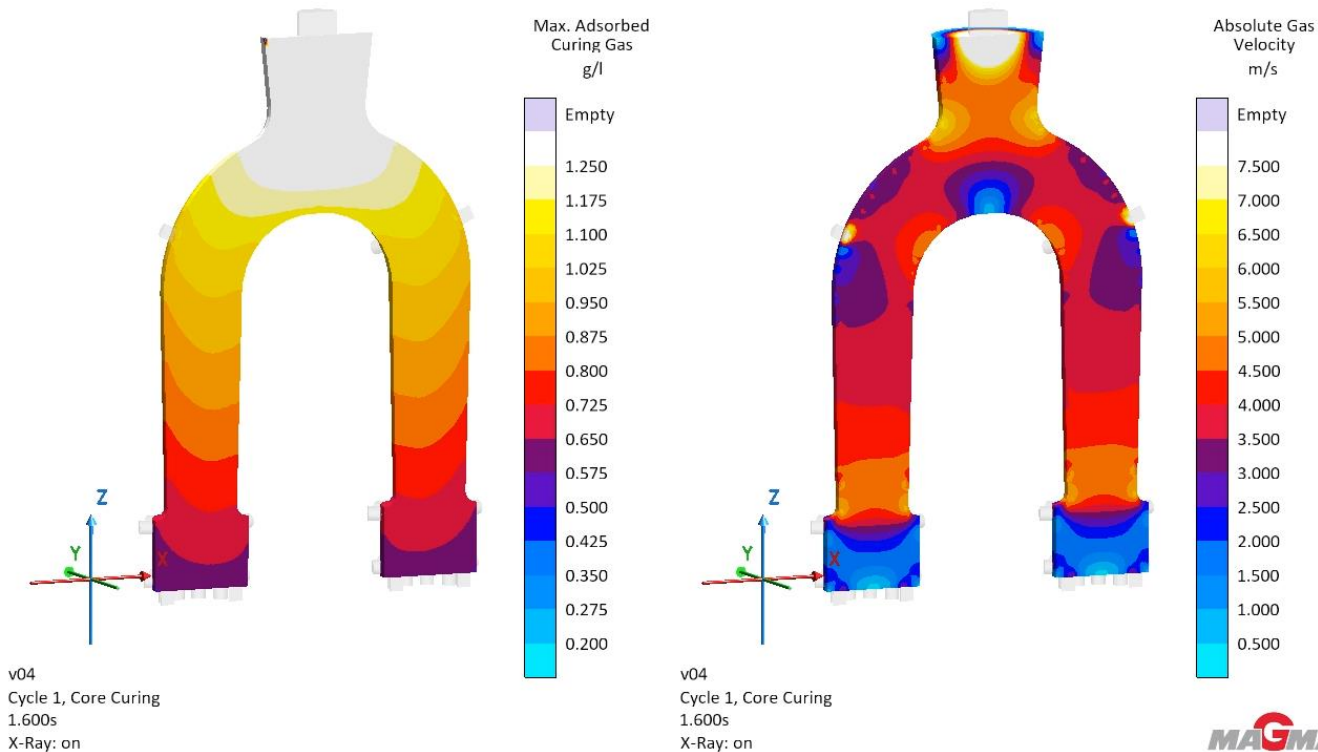
Vertical Shooting / Curing

Gassing – “Traditional”



Vertical Shooting / Curing

Gassing - Improved



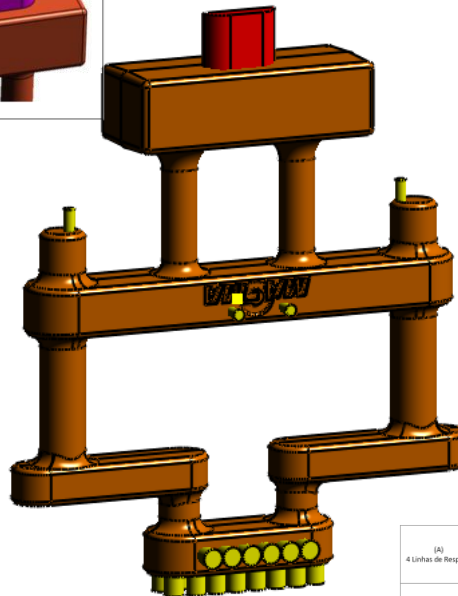
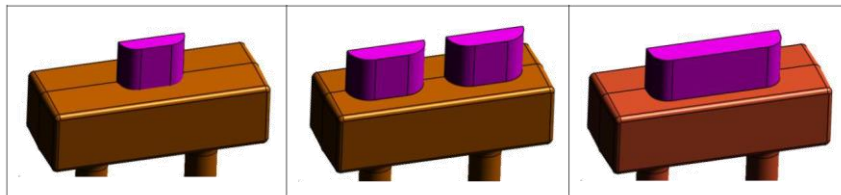
The Challenge

Structure of the practical exercise

- ▢ Design a core that:
 - ▢ Can be shot and cure in a vertical machine
 - ▢ It's not simple to shoot
 - ▢ It's not simple to cure
 - ▢ Fits into the machine (vertical)

The Challenge

Structure of the practical exercise



(A) 12 Respiros		
(B) 8 Respiros		
(C) 4 Respiros		
(D) Sem Respiros		

(A) 12 Respiros	
(B) 8 Respiros	
(C) 4 Respiros	
(D) Sem Respiros	

(A) 4 Linhas de Respiros	
(B) 3 Linhas de Respiros	
(C) 2 Linhas de Respiros	
(D) 1 Linha de Respiros	

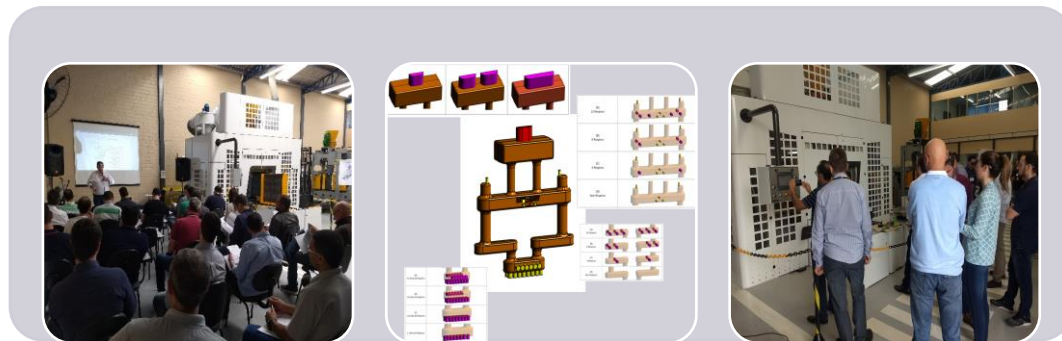
The Challenge

Structure of the practical exercise

- The core box and real core



The training setup



Theory

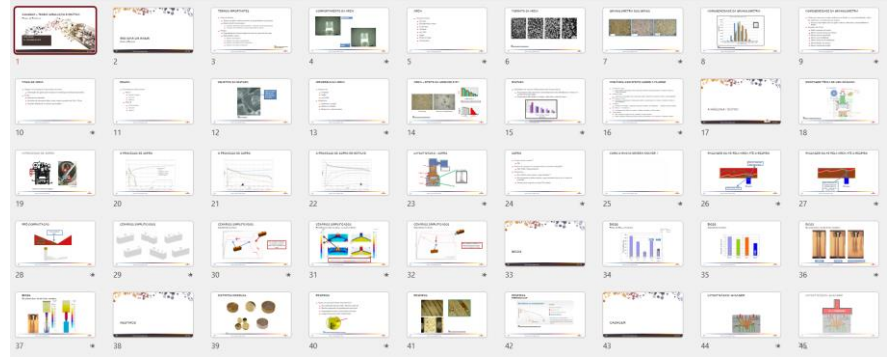
Groups
defining
their
project

Groups
producing

The real Training

Start with a review of Theory

- Shooting
- Gassing



The real Training

Start with a review of Theory

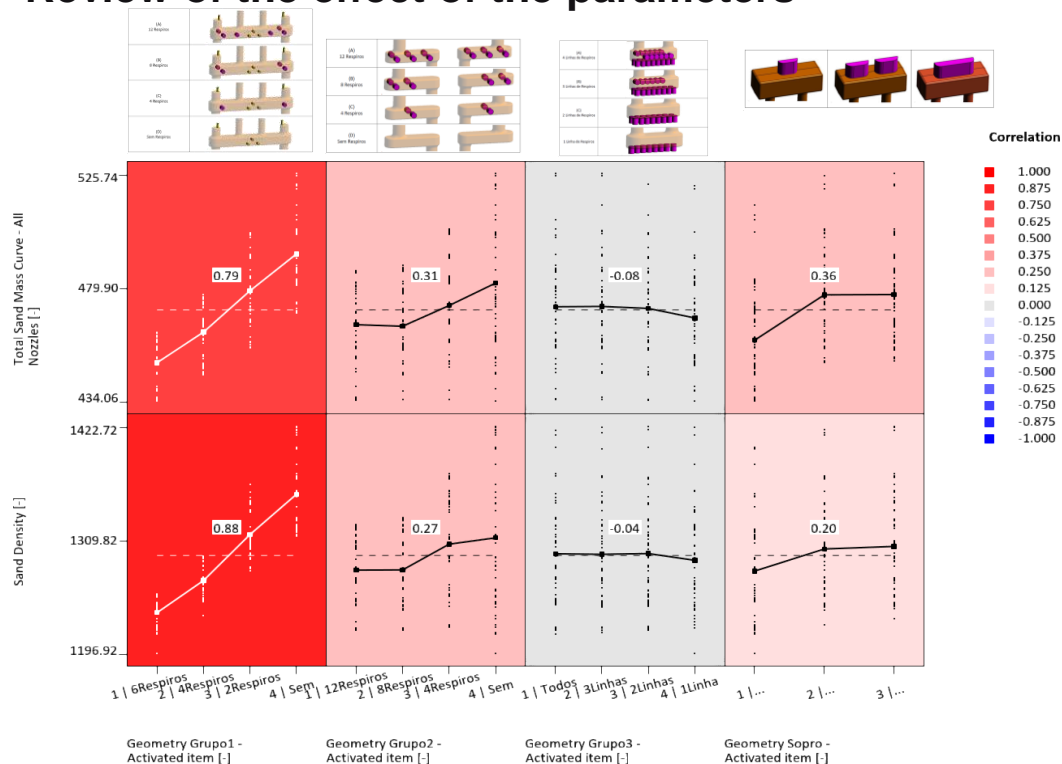
➤ Discussion about Defects



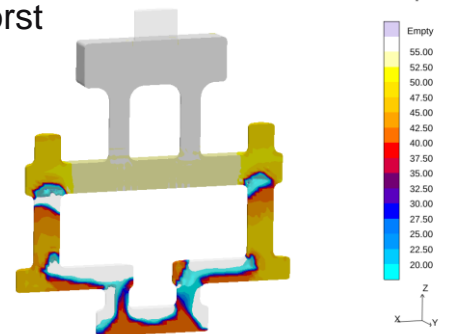
Source:
TREINAMENTO PROJETO E PROCESSO COLDBOX
VENTISTAMP - SETEMBRO 2011

Shooting

Review of the effect of the parameters

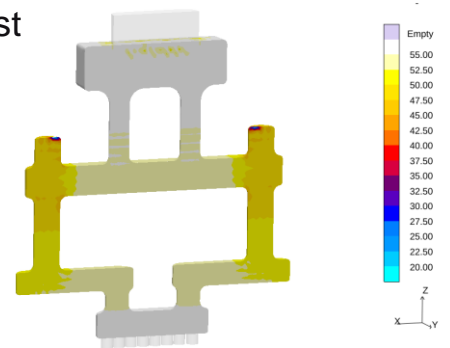


Worst



v16_d181
Sand Fraction
2.000s

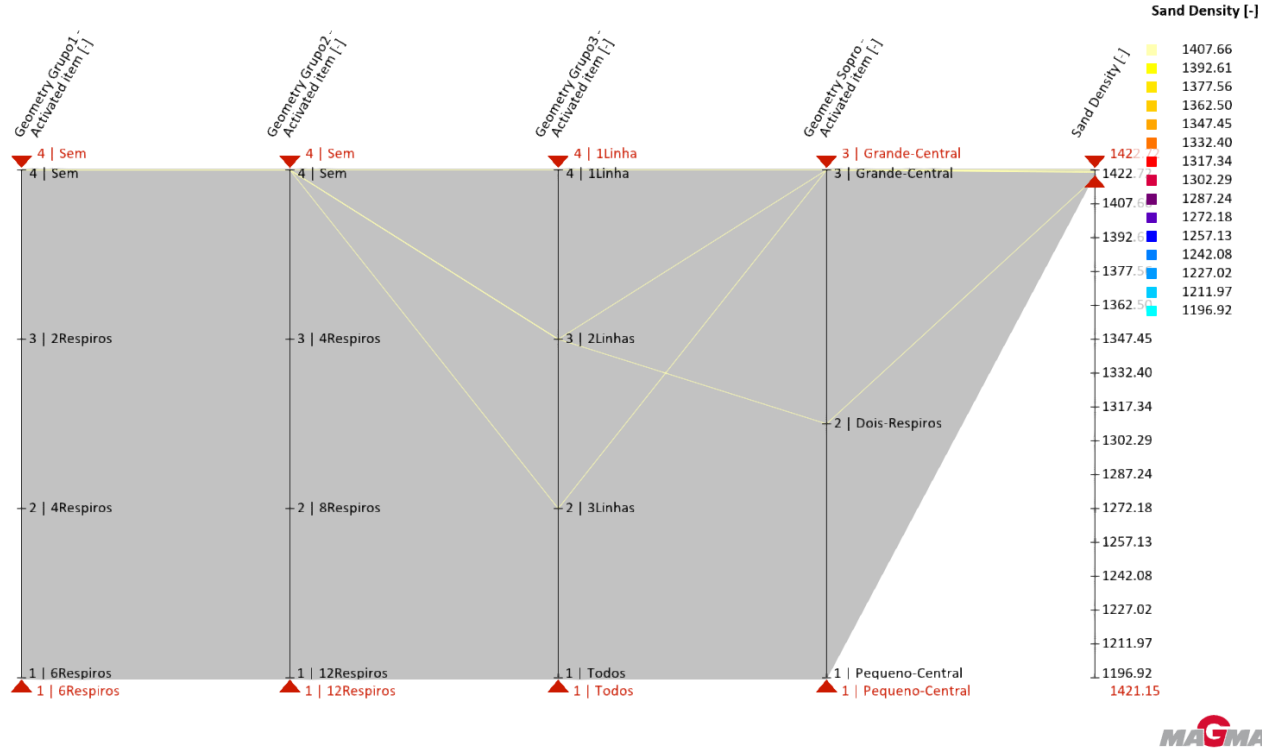
Best



v16_d144
Sand Fraction
2.000s

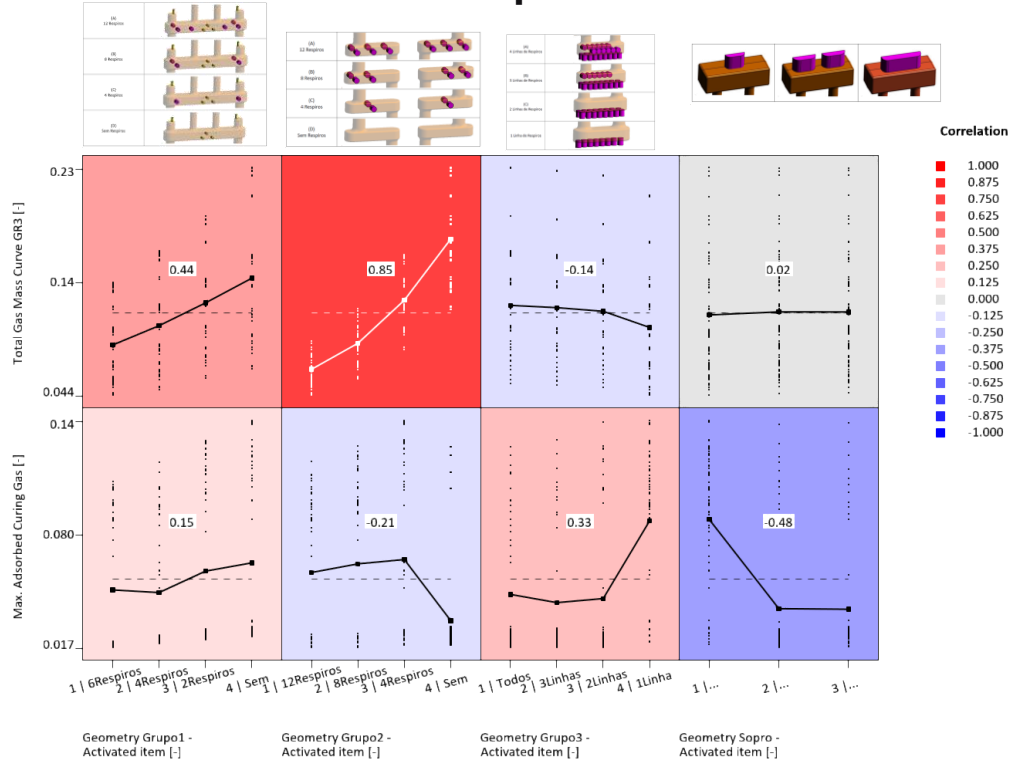
Shooting

Review of the effect of the parameters

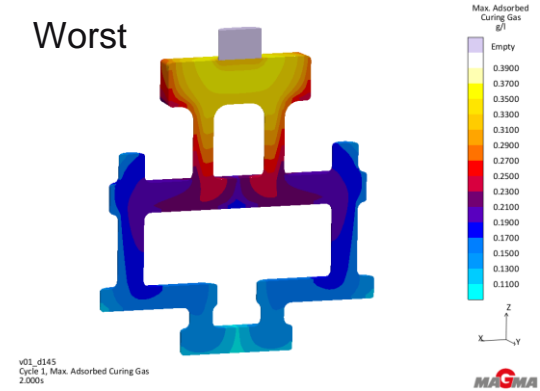


Curing

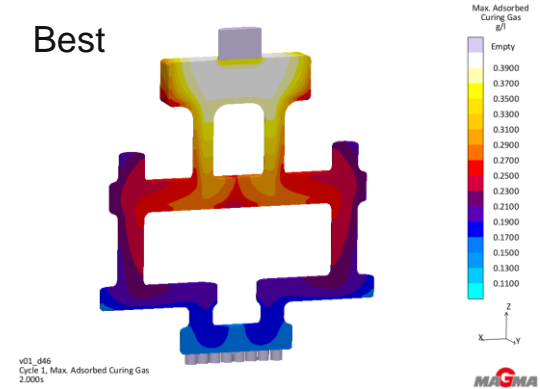
Review of the effect of the parameters



Worst

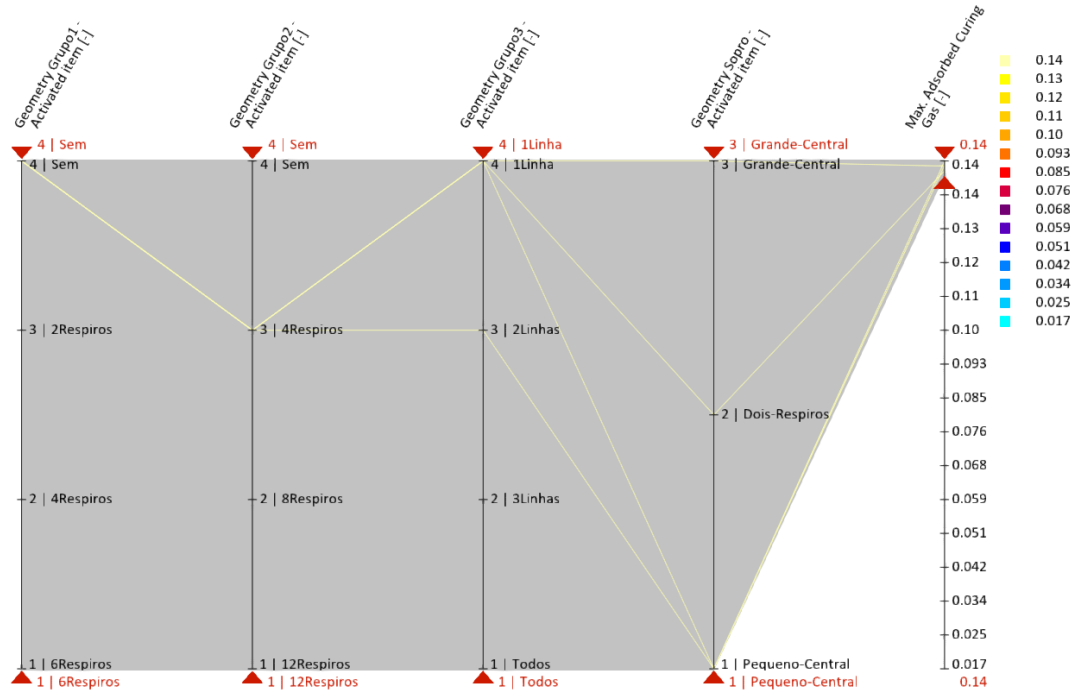


Best



Curing

Review of the effect of the parameters



Exercise

Definition of nozzle and vents



Coldbox – Teoria, Simulação e Prática

Cada grupo deverá desenvolver o projeto de pontos de sopro e respiros. O objetivo desta atividade é propor a condição ideal para o sopro e a gasagem do macho, obtendo o macho com a melhor compactação e melhor gasagem em um setup vertical.

Haverá posições de respiros mandatórias e outras que podem ser alteradas, assim como 3 alternativas de sopro.

As condições genéricas de processo são:

- Sistema Coldbox
- Granulometria de 50 APS com 1% de Resina (Parte I e II somadas)
- Condições de areia excelente
- Pressão de sopro (no pulmão): 3 bars
- Umidade controlada, para uma boa fluidez

As seguintes alternativas devem ser preenchidas:

1. Sopro: seleção de 1 das 3 alternativas de sopro
2. Respiros:
 - a. Fixo: Respiros já pré-definidos
 - b. Grupo 1: Seleção de 1 das 4 Opções
 - c. Grupo 2: Seleção de 1 das 4 Opções
 - d. Grupo 3: Seleção de 1 das 4 Opções



Figura 1 - Imagem do Macho com sopros e respiros



1. Sopro



2. Respiros Grupo 1

(A) 12 Respiros	
(B) 8 Respiros	
(C) 4 Respiros	
(D) Sem Respiros	



3. Respiros Grupo 2

(A) 12 Respiros	
(B) 8 Respiros	
(C) 4 Respiros	
(D) Sem Respiros	

4. Respiros Grupo 3

(A) 4 Linhas de Respiros	
(B) 3 Linhas de Respiros	
(C) 2 Linhas de Respiros	
1 Linha de Respiros	

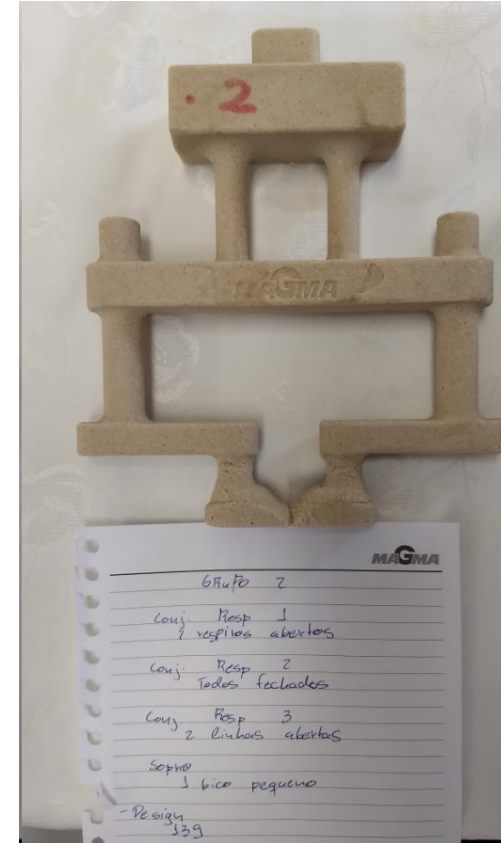
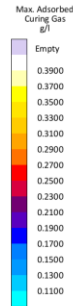
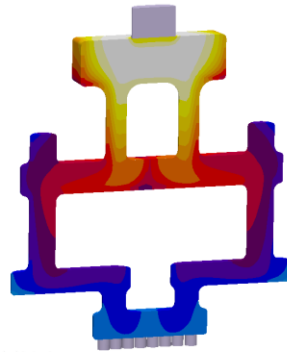
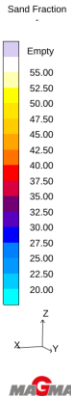
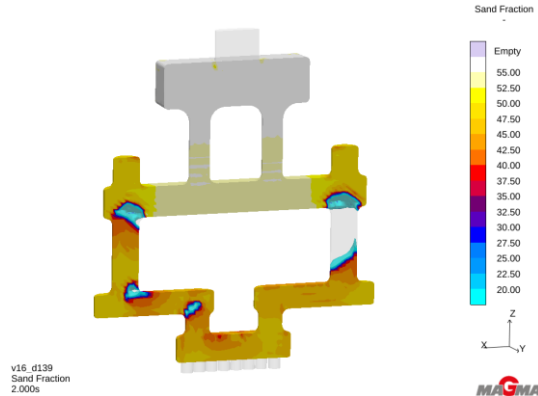
Exercise

Production



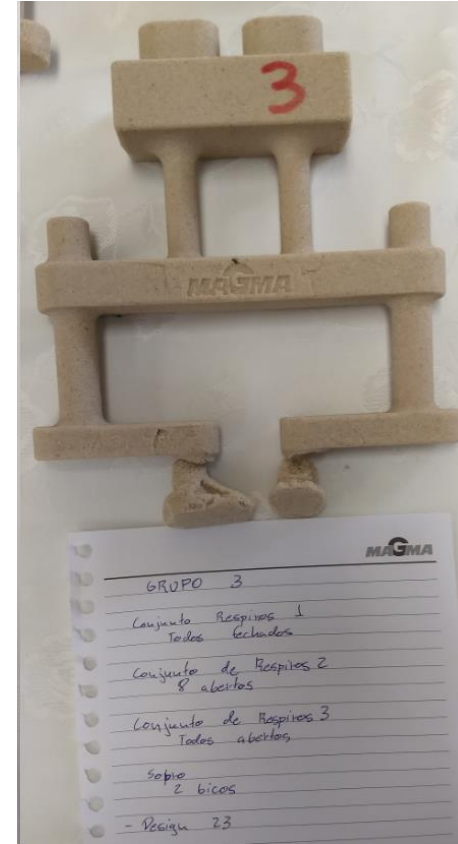
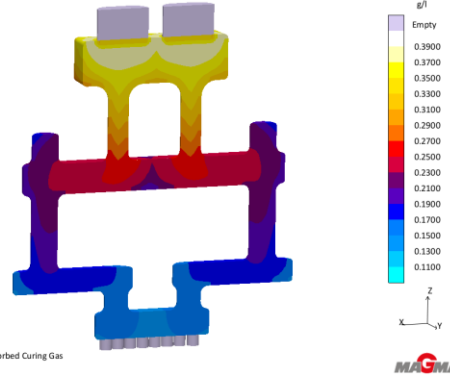
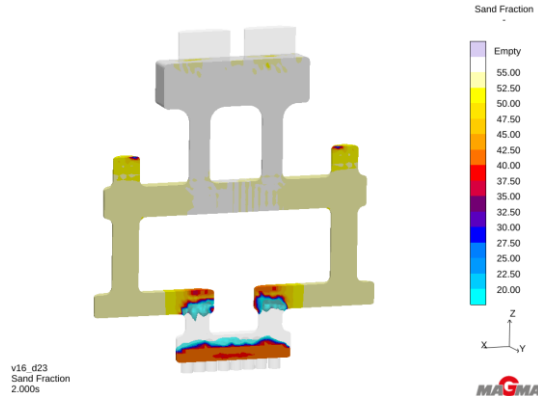
Exercise

Results



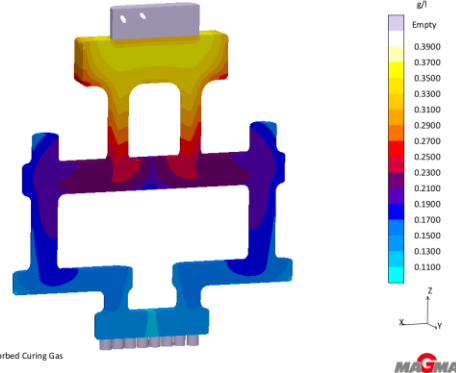
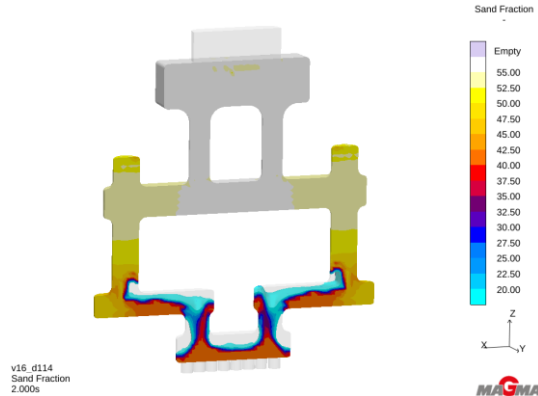
Exercise

Results



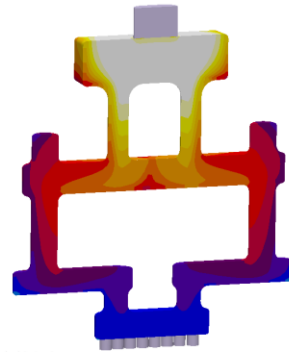
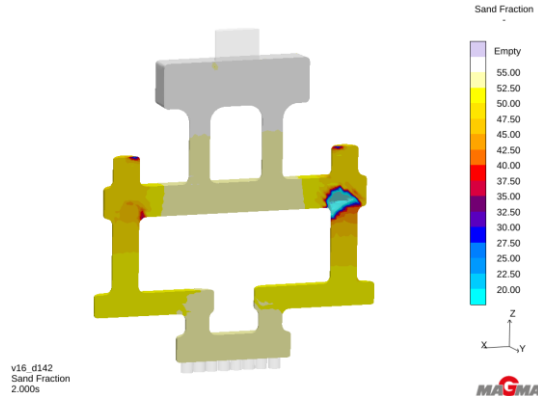
Exercise

Results

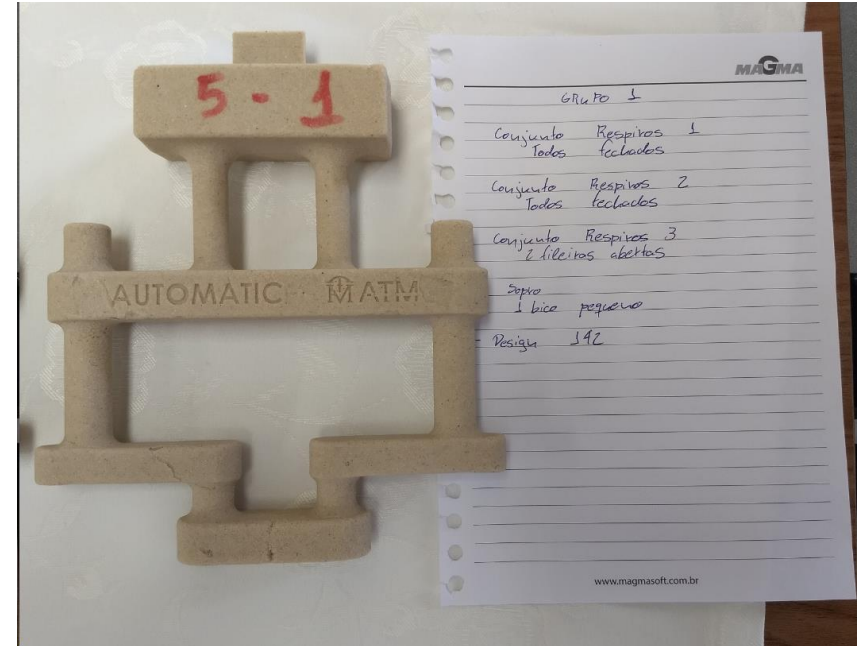


Exercise

Results

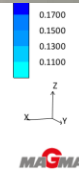
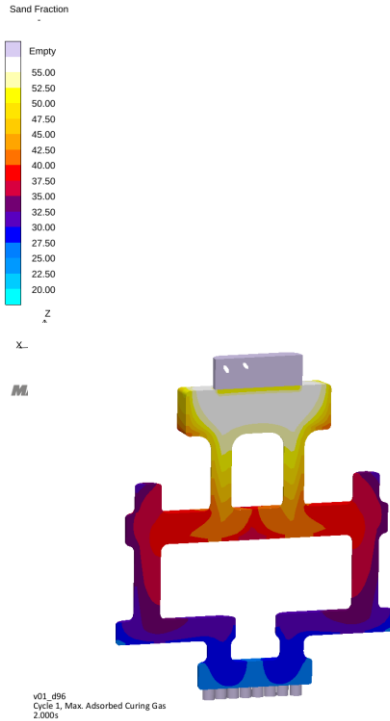
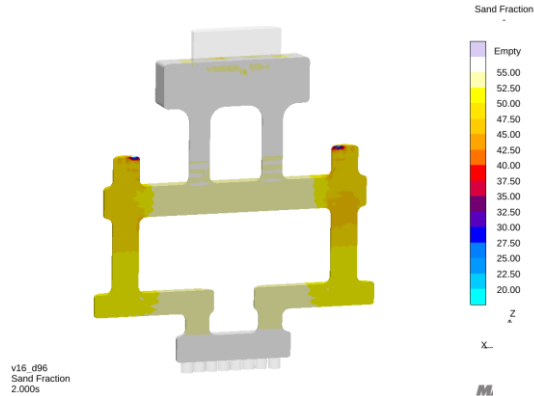


v01_d142
Cycle 1, Max. Adsorbed Curing Gas
2.000s



Exercise

Results



At the end



Conclusion

- Investing into education and deep understanding of the phenomena is important.
- Beside the theoretical foundation, practical connection improves the learning process
- It's important to know:
How to turn a problem on and off!
- **Vents placed on the wrong position cause the biggest damage!**

Thank you for your attention.

MAGMA Gießereitechnologie GmbH