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FERA
FERRAMENTAS
MANUFATURADAS
ADITIVAMENTE



Project “FERA Rota 2030”: Overcoming the Mental Barriers of Metallic Additive Manufacturing

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Aloísio Nelmo Klein, Prof. Dr. (UFSC)

Me. Moysés Leite de Lima (IPT)

04-09-2024

CONFIDENTIAL



AM has a disruptive potential to increase the competitiveness of the **Tooling Chain**. However, **application is not mature**.



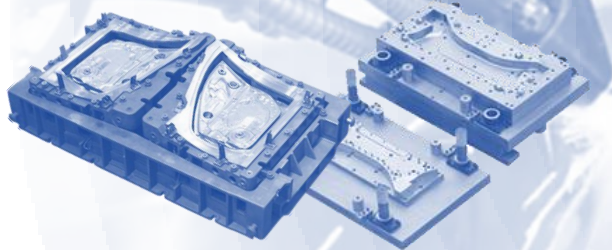
FERA

FERRAMENTAS
MANUFATURADAS
ADITIVAMENTE

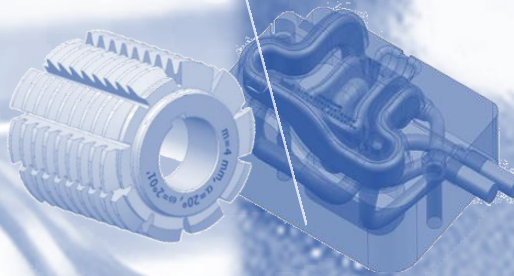


FeB+C

1 Semi-automated AM
Repair of stamping tools



2 AM of tools with
complex geometries



3 AM of fixtures/jigs
and spare parts



Development of Additive Manufacturing for the repair and manufacture of Tools for the Brazilian Automotive Industry

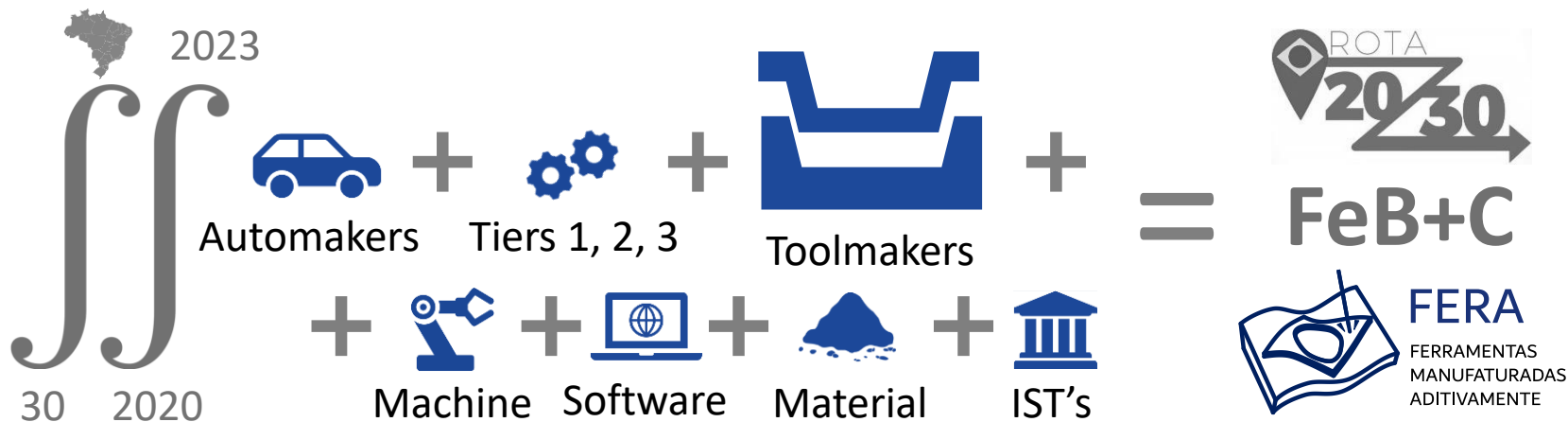


- 39 months [Dec.20 – Feb.24]
- Funding: R\$ 6 mi (Total: R\$ 12.7 mi)
- 26 companies + 4 STIs

“Metallic Additive Manufacturing is ...

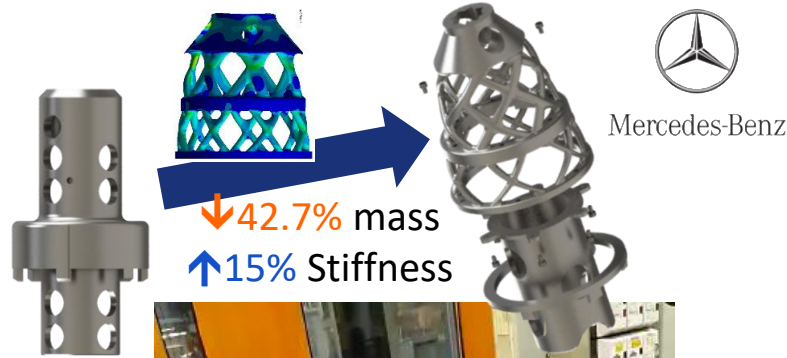
*... **only prototyping.**
It does not apply to
production in Industry.”*

FERA - Ferramentas Manufaturadas Aditivamente: *Partners Network*

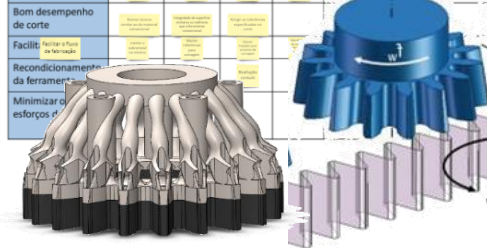
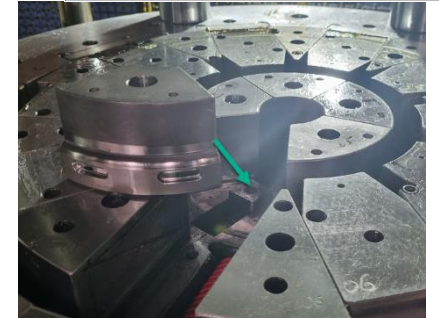
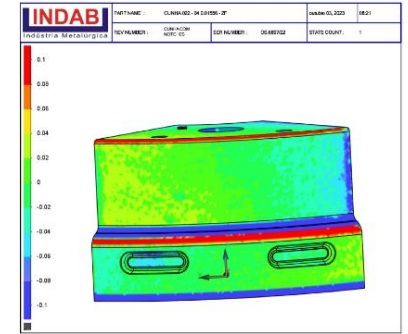


Project FERA: Main Results

Production testing of the FERA project solutions



Mercedes-Benz



CIP-COMPANHIA INDUSTRIAL DE PEÇAS



“Metallic Additive Manufacturing is ...

*... a **German business,**
not a Brazilian reality.”*

Project FERA: Worldwide Network

FERA
PARTNERS NETWORK

FCA
FIAT CHRYSLER AUTOMOBILES

Ford

PSA
GROUPE

BOSCH

Mercedes-Benz

Alkimat

Casafer
A CASA DO FERRAMENTEIRO

STIHL

JR OLIVEIRA
Soluções Inteligentes em Moldes

Höganäs

Fraunhofer IPK

4 STI's
25 Companies

ipt

GM

ROMI

BOSCH

IOCHPE-MAXION

StarSU

SABO

emitedi

VAS
TECNOLOGIA INDUSTRIAL

INDAB
Industria Metalúrgica

niken

RÖSLER
finding a better way...

ÖTEC

VirtualCAE

Blaser
SWISSLUBE

TopSolid

FARCCO
TECNOLOGIA

CIP-COMPANHIA INDUSTRIAL DE PEÇAS



Project FERA: Worldwide Network

■ International Benchmarking

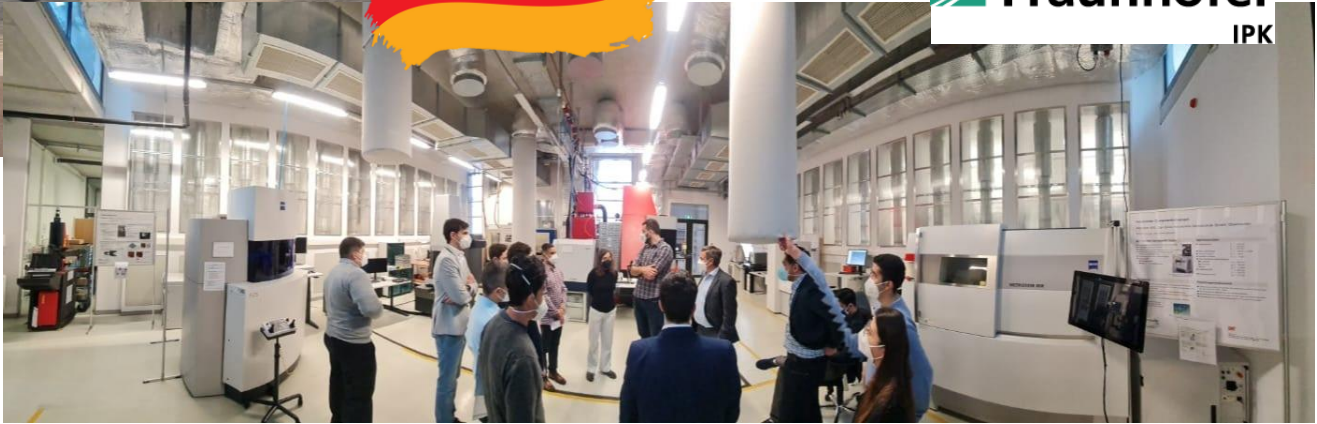


voestalpine
ONE STEP AHEAD.



Fraunhofer
IPK

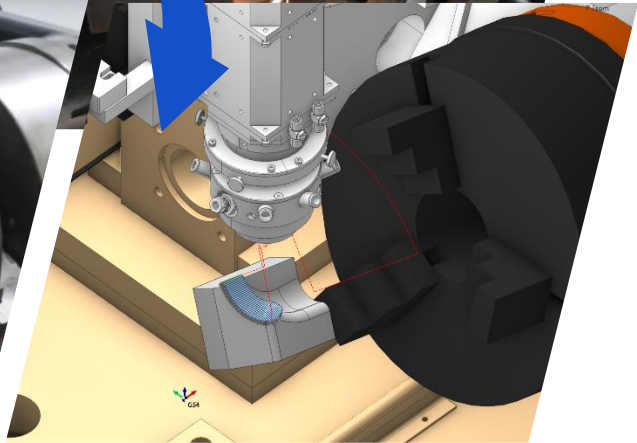
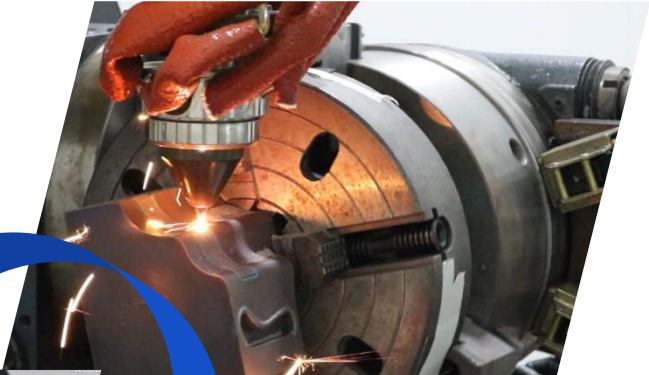
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Project FERA: Main Results



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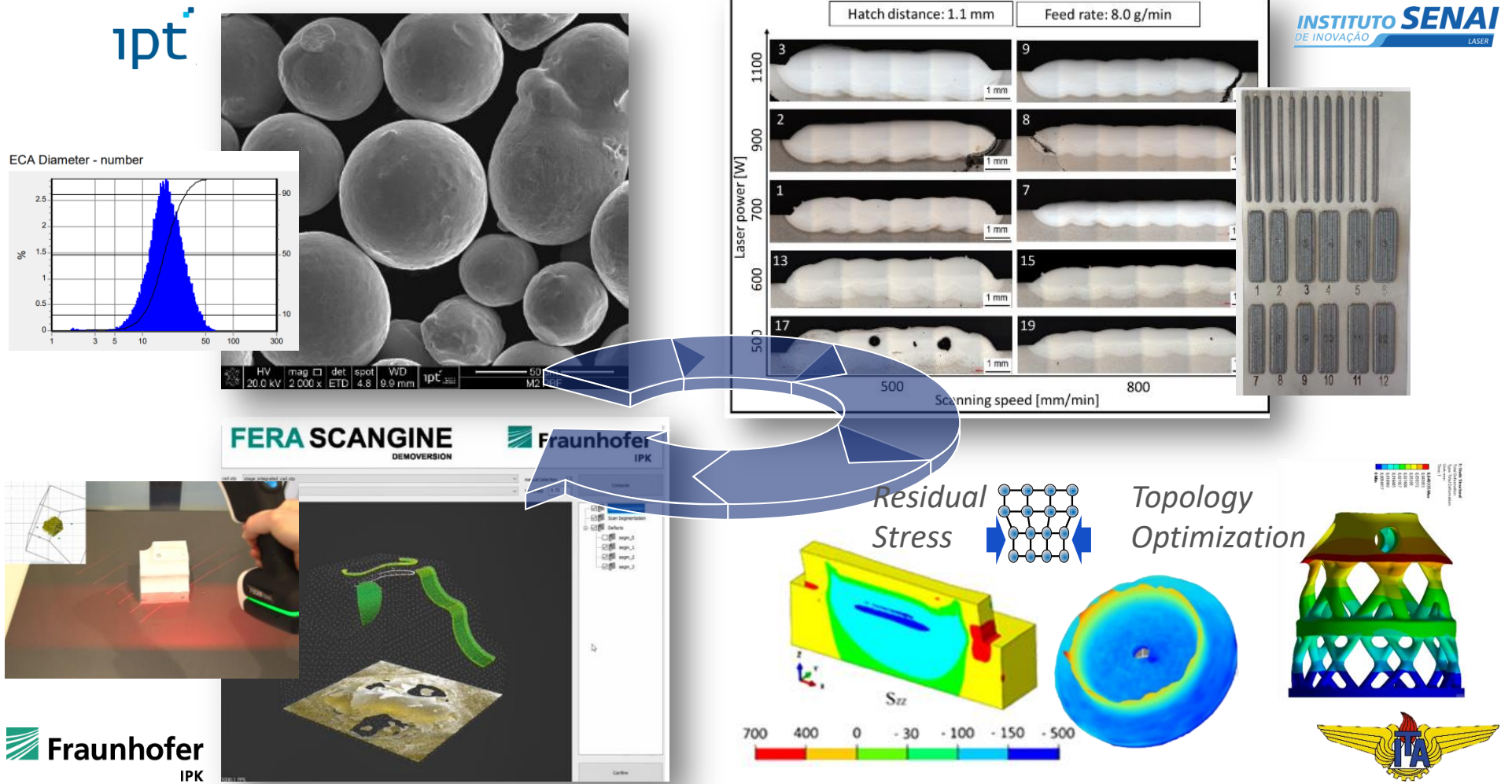
“Metallic Additive Manufacturing is ...

... Rocket Science.

Too complex to understand.”

Project FERA: Main Results

- Integration of **existing competences**

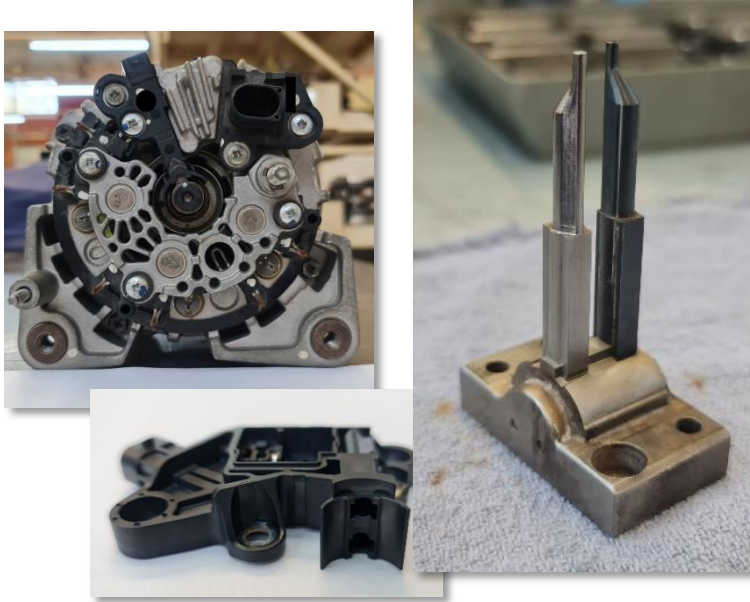


“Metallic Additive Manufacturing is ...

... too expensive.

Our investment will not return.”

Project FERA: Main Results



- Production Increase

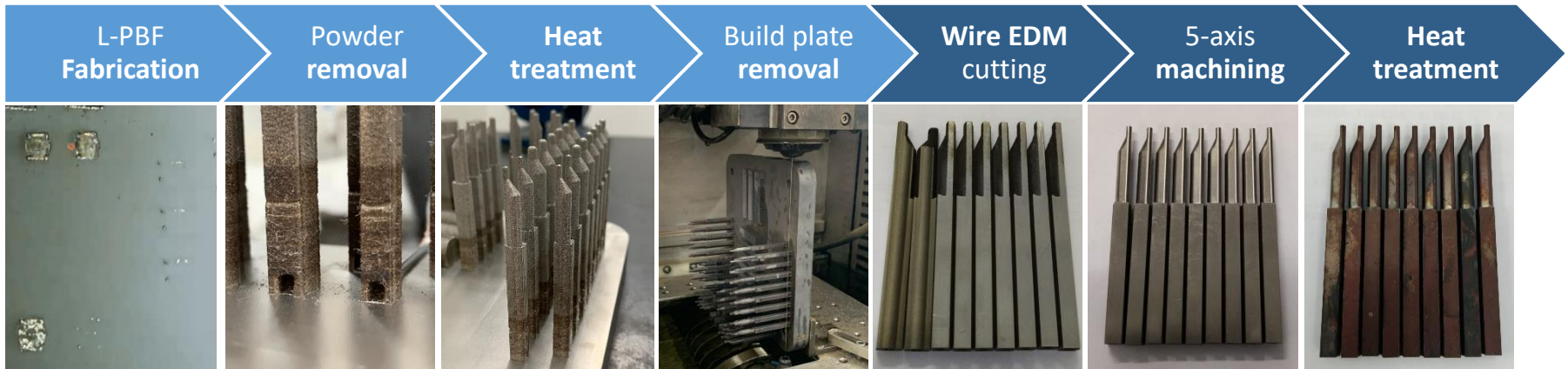
With conventional cooling

195 parts/hour

With conformal cooling (AM)

212 parts/hour

- Savings: ~23k/year (Just considering the production increase)
- Process automatization could increase even more the production up to **244 parts/hour**



Summary and Outlook

- “Metallic Additive Manufacturing is ...
 - ✘ ... **only prototyping**. It does not apply to production in Industry.”
 - ✘ ... a **German business**, not a Brazilian reality.”
 - ✘ ... **Rocket Science**. Too complex to understand.”
 - ✘ ... **too expensive**. Our investment will not return.”

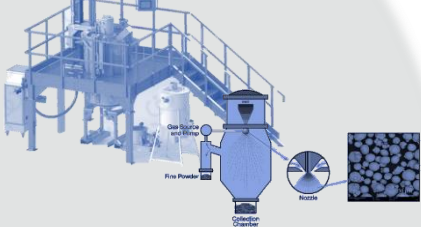


*New barriers are yet to come.
This journey **cannot stop now**...*

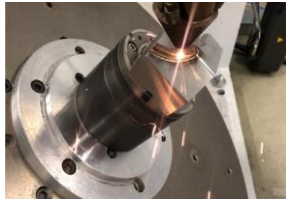
JUST SIGNED!

FERA II

Powder Production



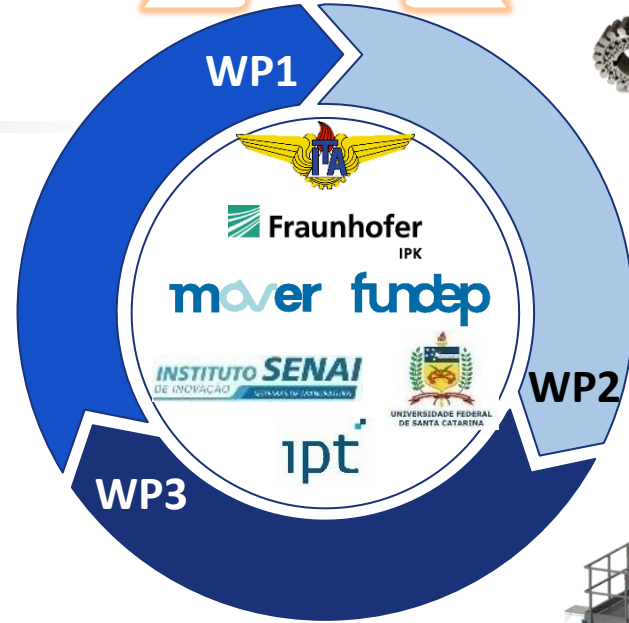
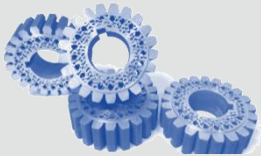
Industrial Application and Qualification



Sustainability



Scalability



Scalability and Durability

National Raw Material Development



36 months

59 researchers

R\$56.2 MM

29 companies

OEM's	Tiers 1, 2 and 3	Tool makers	Machines	Material	Software
<p>X 4</p>	<p>X 10</p>	<p>X 4</p>	<p>X 7</p>	<p>X 1</p>	<p>X 3</p>

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Obrigado!
Thank you!

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