LIFT THE TECHNOLOGICAL LIMITATIONS

Additive technology in motorsport

- CONCEPT PRAGA BRAKE DUCT DESIGN
- UNLOCK POTENTIAL TO ENHANCE THE TECHNOLOGY

Solution powered by

3DGENCE

On demand end use parts

The aims of this project were: to manufacture concept brake duct components from in house designs to trial and ultimately track use.

This component needed to not only function as a brake duct, allowing air to be directed towards the brake components, but also be manufactured to be lightweight and strong, easily removed quickly, and secure to function in harsh operating environments.

THE CHALLENGE

INITIAL IMPRESSION

Brake sensitivity to temperature

OVERHEATING BRAKES

Reduction in driving characteristics

BRAKE EFFICIENCY

Reduced and does not perform to the best of its ability

DEVELOPMENT CONSTRAINTS

MANUFACTURING TECHNOLOGY

PROJECT TIMING

DEVELOPMENT STRATEGY

ELIMINATION OF CONSTRAINTS

3D Printing Technology implementation

FIT TESTS

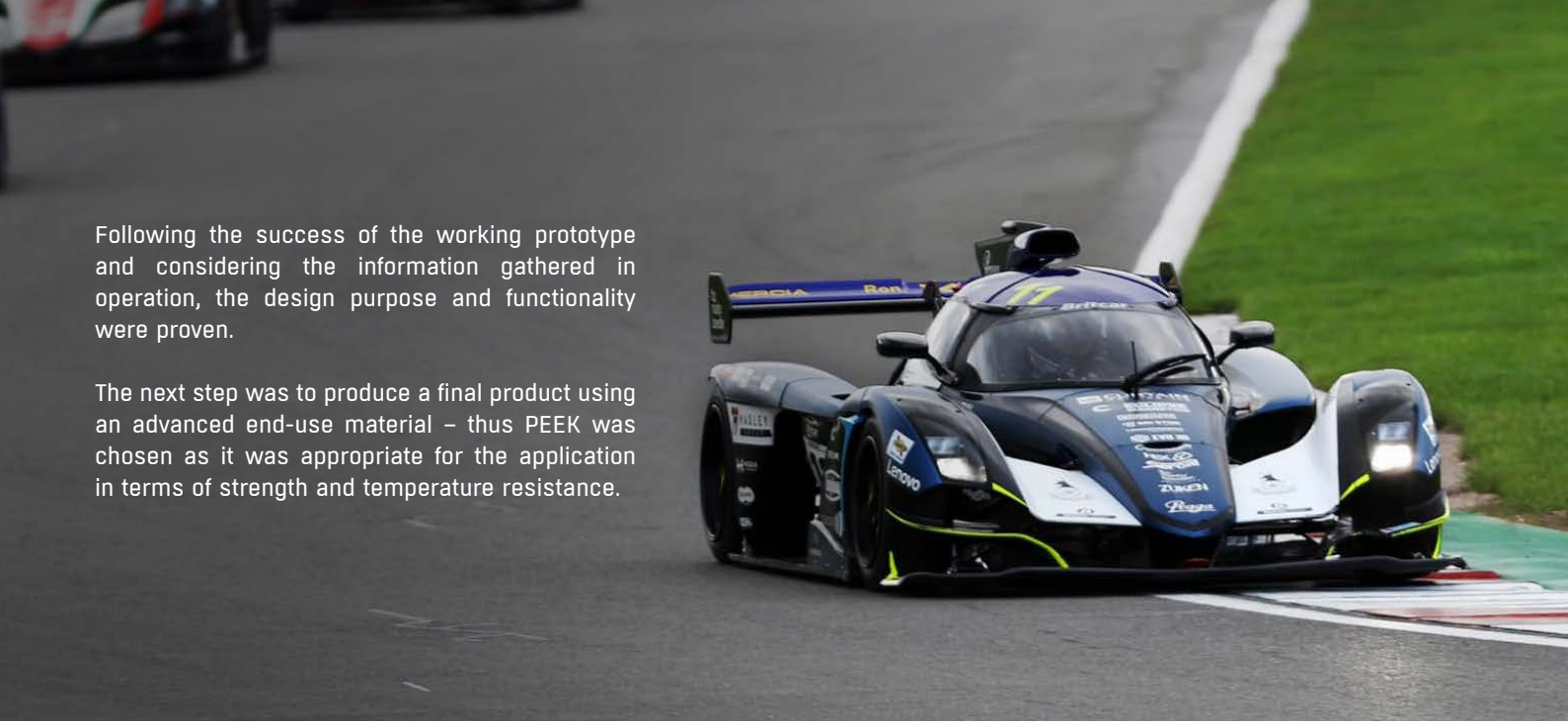
Rapid prototyping using commodity material (ABS)

FUNCTIONALITY TESTS

Real world application and final design prototype using engineering material (PA-CF)

FINAL PRODUCTION PART

Lightweight high-performance & high-temperature resistant material (PEEK)



Following the success of the working prototype and considering the information gathered in operation, the design purpose and functionality were proven.

The next step was to produce a final product using an advanced end-use material – thus PEEK was chosen as it was appropriate for the application in terms of strength and temperature resistance.

WHY 3D PRINTING?

DESIGN FREEDOM

Engineering creativity not limited by manufacturing technology

WIDE RANGE OF MATERIALS

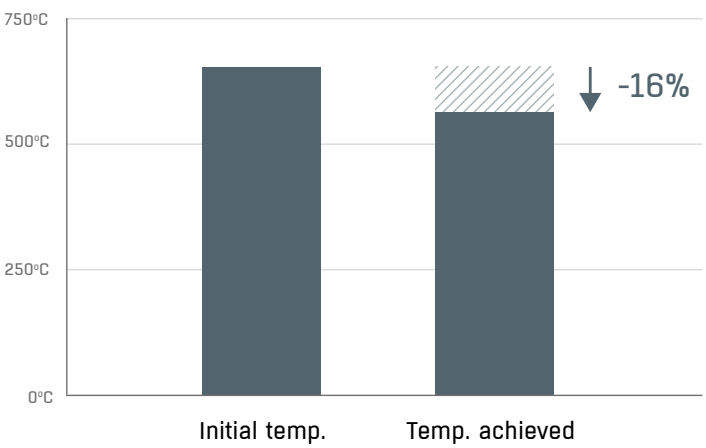
Easily applicable and tailored to your needs

FLEXIBLE, FAST & ACCESSIBLE

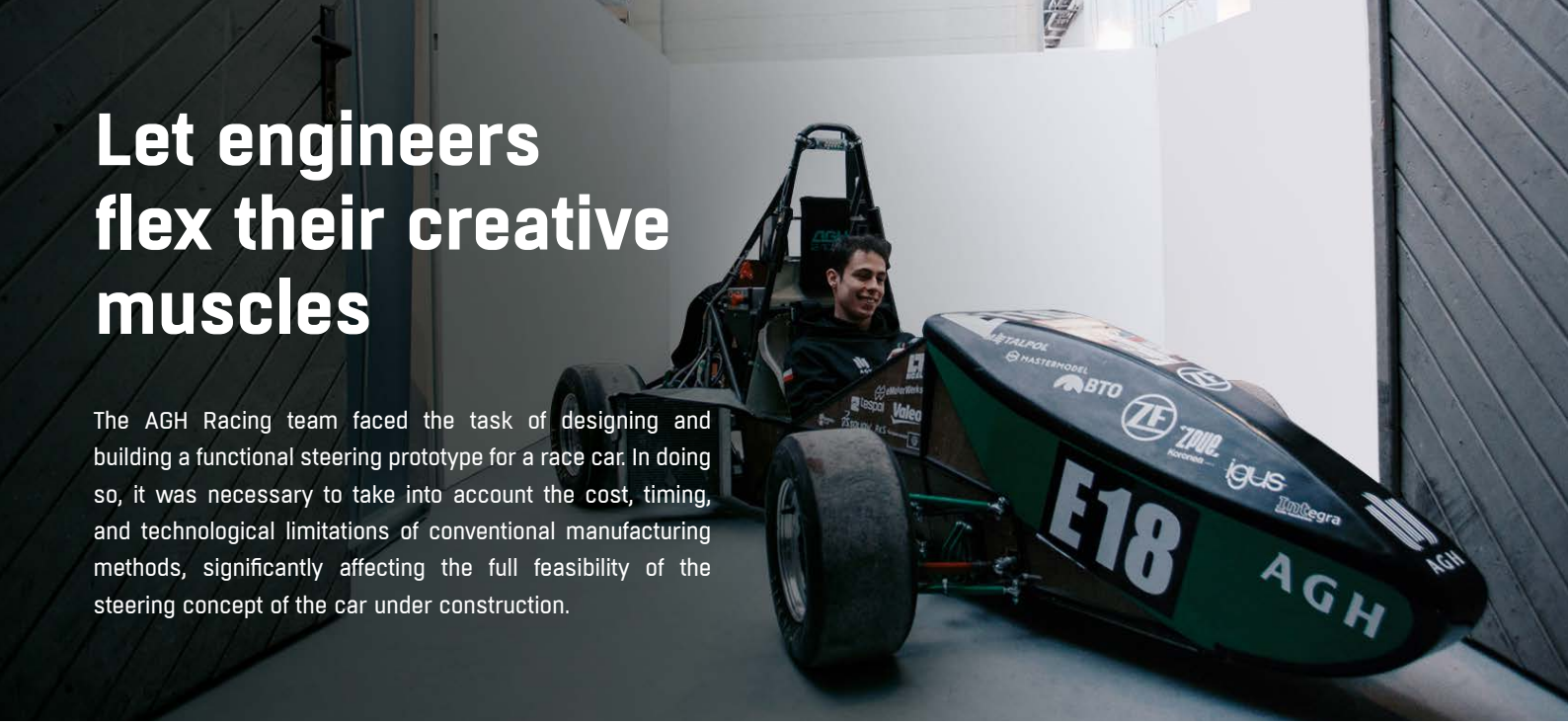
Cost effective, rapid and trustworthy manufacturing technology

THE RESULT

Temperature reduction of the braking system.



Let engineers flex their creative muscles



The AGH Racing team faced the task of designing and building a functional steering prototype for a race car. In doing so, it was necessary to take into account the cost, timing, and technological limitations of conventional manufacturing methods, significantly affecting the full feasibility of the steering concept of the car under construction.

THE CHALLENGE

- **LIGHTWEIGHT HIGH PERFORMANCE**
- **MECHANICAL PROPERTIES**
- **COMPLEX SHAPE**
- **LOW COST OF MANUFACTURING**
- **SHORTENED LEAD TIME**

DEVELOPMENT CONSTRAINTS

- **MANUFACTURING TECHNOLOGY**
- **PROJECT TIMING**

DEVELOPMENT STRATEGY

DESIGN OPTIONS

Model A: Designed for CNC

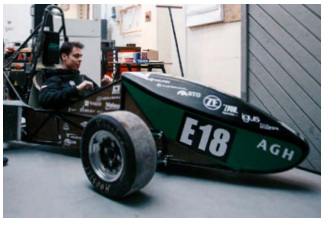
Model B: Designed for 3D Printing

ELIMINATION OF CONSTRAINTS

3D Printing Technology implementation for shortening lead time

FIT TESTS

Real world application prototype and final design in engineering material (ABS)



FINAL PRODUCTION PART

Final part was produced by aluminium die casting. Mould was prepared with final 3D Printed part

3D PRINTING BENEFITS

	CNC	3D Printer
Total cost	675 €	**48,44 €**
Lead time	29 days	**3 days**
Model weight	1013,85 g	**143,01 g**

WHY 3D PRINTING?

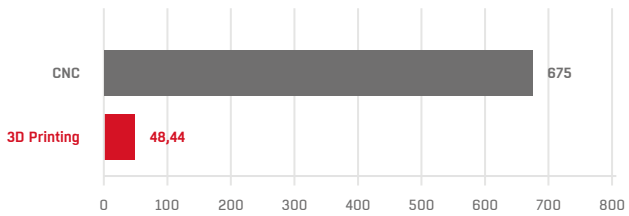
Weight reduction
86%

Decrease cost
92%

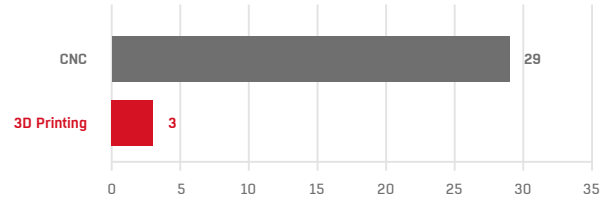
Shorten lead time
of prototype 90%

THE RESULT

Prototype production cost [Euro]



Lead time [days]



*calculation refers to the model shown in the picture

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