

# Newsletter

Herkules Racing Team  
Kassel

March 2020

## Events

In order to participate in the events, all teams have to complete quizzes to qualify, where they have to do very well and better than the rest of the teams.

In these quizzes, questions about the regulations are asked, but for the most part they are engineering-related tasks from various fields, be it mechanics or electrical engineering. All our knowledge is required here. All questions must be solved within a certain time.

On 31.01.20 were the registration quizzes for all Formula Student events. All quizzes were spread over the day and closely staggered. It started at 9 am with the Switzerland quiz, continued at 11 am with East (Hungary), followed by FSG (Germany) at 1 pm. Afterwards we had a little break, where everybody ate something together and came down a little bit. But at 5 pm it was „full concentration“ again, then it was the turn of the Netherlands Quiz. Everybody nervously looked at the screen and waited for the quiz to be activated, but unfortunately the FSN had difficulties with the website and so this quiz for this day was cancelled and moved to the following Monday. The FSA (Austria) quiz came last. At a late hour the concentration seemed to drop, so we didn't do as well as desired in the FSA quiz.

But we are very proud to have successfully qualified for the quiz at 3 events.

We have successfully registered for these 3 events:



05.07. – 09.07.2020



15.07. – 19.07.2020



04.08. – 09.08.2020



## Teagoals Season 2020

In our concept phase at the beginning of the season, the team gave a lot of thought to the 2020 season and the associated team goals.

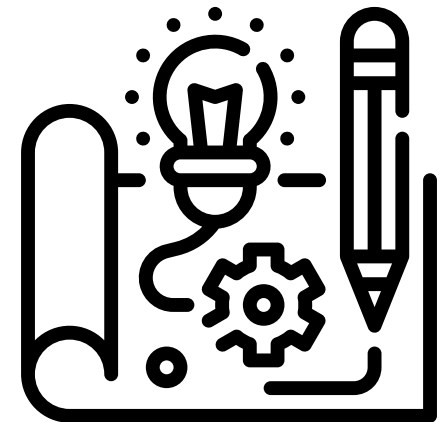
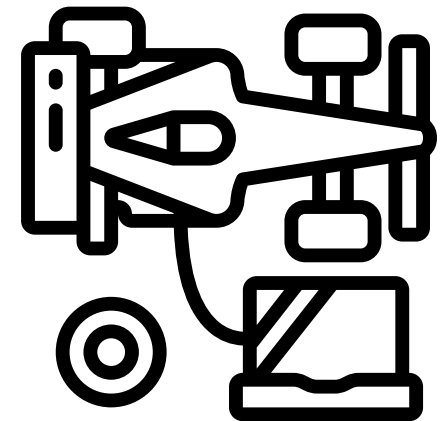
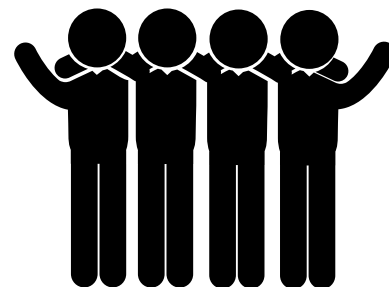
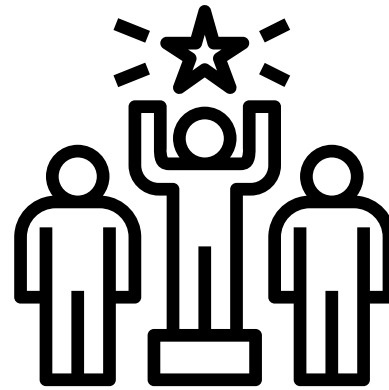
The team has set itself the following goals:

Our race car should be simple and reliable. So this season, we will avoid complicated conversions and components or manufacturing processes that nobody has really experienced yet.

Since we built our first race car with electric drive last season and have gained a lot of experience, we naturally want to do a lot better this season and want to drive through all disciplines. We also want to achieve a very good placement among the top 10 teams at the events.

In addition, with the goal of „meeting deadlines“ we also want to achieve the goal of „plenty of test time“.

We are looking forward to this season and are highly motivated to reach our goals.





# Digital Roll-Out

## Chassis:

Our monocoque this year consists of 2 halves - top and bottom. Also the manufacturing process has changed a bit compared to last season, this year we produce our monocoque not only in 2 halves but also with a new form concept. We have made a CFK mould, the material for our mono remains carbon fibre prepreg as last year. This year our Mono has a tailgate, so we can reach the battery and other components inside better and therefore maintenance work is easier. We will also laminate and save the shoulder harness bar and dashboard, and here we will add additional brackets and tubes and the weight that comes with them.



## Suspension:

The development of the chassis followed the principle keep it simple. The complex three-damper concept of the predecessor vehicles was replaced by a much simpler concept. The front dampers are connected directly to the wheel carrier without deflectors. At the rear, an anti-roll bar provides the necessary adjustment options in racing operation. These changes allow us to reduce the number of components required in the chassis. The production time of the whole racing car is thus reduced and allows us a longer test time in summer. Also the so-called compliance can be reduced by the reduced number of components. It describes the deformation under load and has a negative influence on driving behaviour. Through many other small changes, including the wheel assembly consisting of gearbox, wheel hub, wheel carrier and brake, almost 10 kg of weight could be saved in the chassis alone. This corresponds to a weight reduction of 16.5%.







# Digital Roll-Out

## Electrical engineering:

For the traction battery, this season again, cylindrical cells are used. As a change to the pre-season, air cooling is used, as this ensures better maintainability.

The inverter of the HRT20 is located above the battery, therefore the four inverter blocks are arranged on one level. The AMK Racing Kit is used again, so we can take care of a proper shielding this season.

The safety boards from last season can be used again, because there were no rule changes to them. Only with the Brake System Plausibility Device functional errors were found, so we use a purchased part at this point.

After the bad experience with the wiring harness due to too little planning, this season someone was assigned to plan it from the beginning.

The system electronics are powered by a LiFePO battery, whose voltage is reduced to a constant 24V by a voltage converter.

For the engine control unit from Speedgoat we can rely on good preparatory work from last season. Arduinos are used to evaluate the analog sensors, which transfer the signals to the sensor CAN bus.



## Aerodynamics:

The aerodynamics were fundamentally revised this year. This has resulted in a more complex structure overall, which is intended to ensure optimum flow conditions in the various areas of the car. For example, the front wing, as the first contact with the airflow, is divided into three different areas. The side box is designed so that a high volume flow can be used to cool the engines. For the rear wing, the concept of the gooseneck was reintroduced as an attachment and a new three-dimensional design was developed for the main wing.

A further main focus in the development of the aerodynamics was the consideration of the whole vehicle in order to achieve a good balance, which is decisive for the driving behaviour.

With all these changes we still remain true to our distinctive feature of the wooden wings.



## Rollout HRT20

We are pleased to present you our new racing car, the HRT20, on 30.04.2020 at 17:00 in the Campus Center of the University of Kassel.



University of Kassel  
Campus Center, Hörsaal 1  
Moritzstraße 18  
34109 Kassel





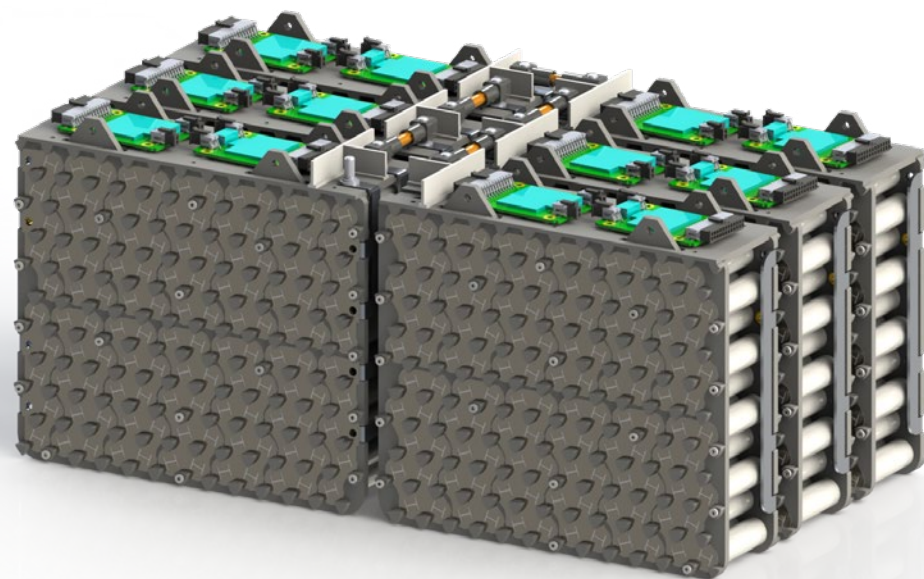
## Cell sponsors-

Also this year we have a battery sponsorship program for our racing car. As the 720 high performance battery cells for our speedster tear a hole in our wallet, we are dependent on support for financing. If we have aroused your interest in supporting us in achieving our goals, you can take over a battery cell sponsorship for a one-time 20€. One sponsorship corresponds to 4 cells.

On our website under

<https://www.herkulesracing.de/batteriepatenschaft-1920/>

you will find a form and further information. If you have any questions, please do not hesitate to contact us.





 Many Thanks to our Sponsors!



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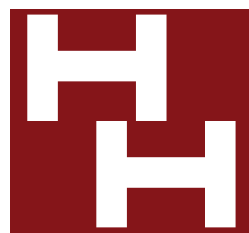


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... wir bringen Dinge ins Rollen!

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