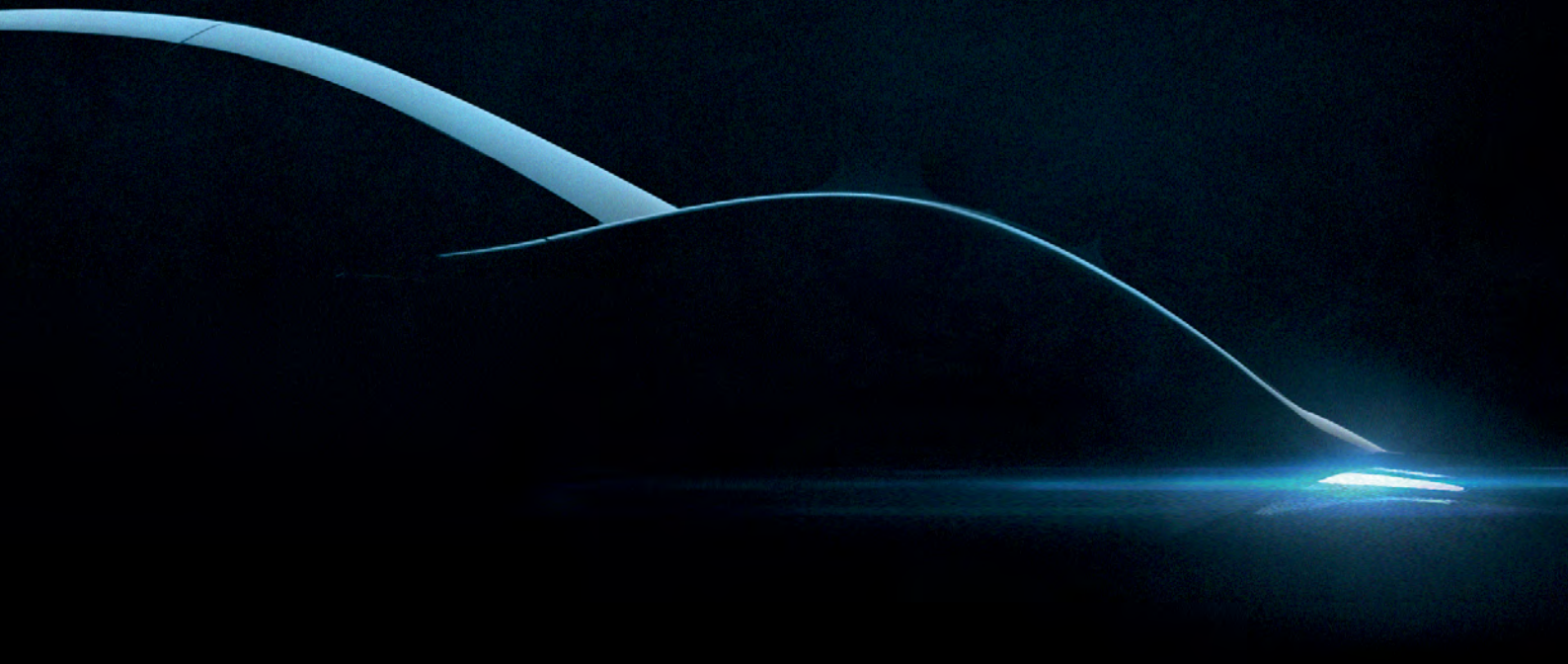
First Slovak
Hydrogen Concept Car



Matador GROUP

TECHNICAL UNIVERSITY OF KOŠICE
Faculty of Mechanical Engineering


MH2

What is **MH2?**

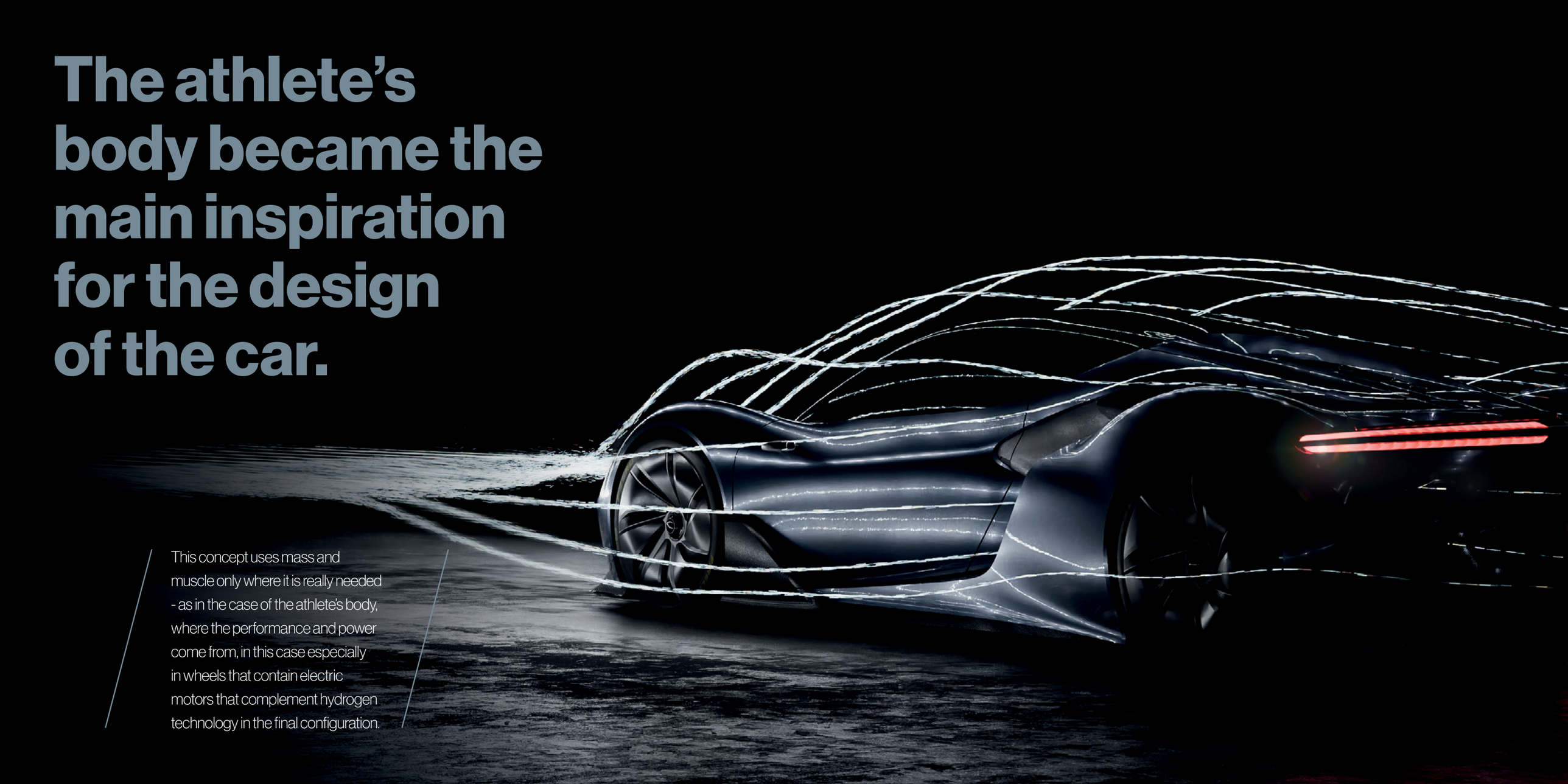
One of the most traditional Slovak brands, the MATADOR Group, has created a modern sports car concept in cooperation with the Slovak University TUKE, based on both, the progressive hydrogen technology, and the timeless design.

MATADOR Group and TUKE in Košice introduce the concept of the MH2 vehicle, which will represent Slovakia at the EXPO 2020 World Exhibition in Dubai.

This concept is a vision of the future, which we bring closer in the form of a super sports car with hydrogen propulsion.

Athlete **of the Fut ure**

The athlete's body became the main inspiration for the design of the car.

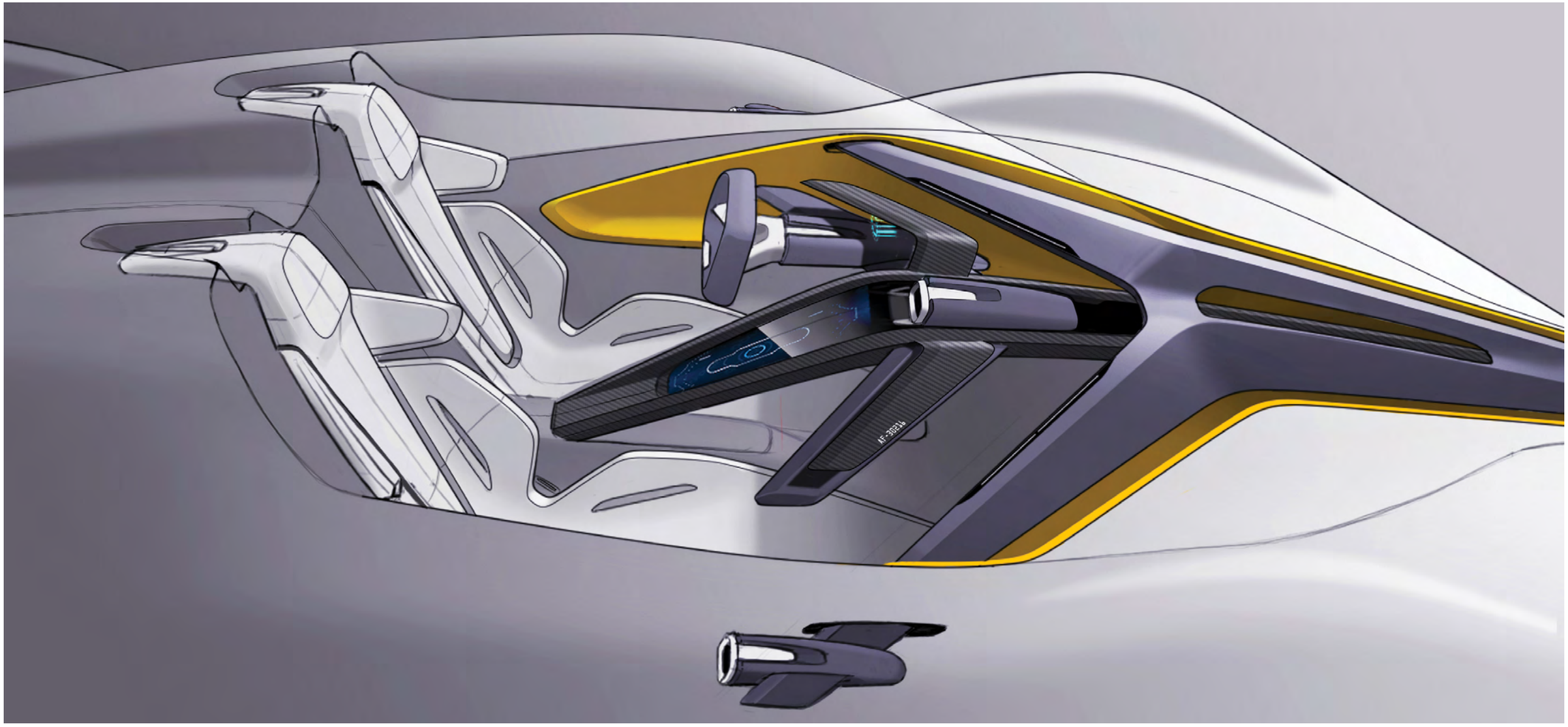


This concept uses mass and muscle only where it is really needed - as in the case of the athlete's body, where the performance and power come from, in this case especially in wheels that contain electric motors that complement hydrogen technology in the final configuration.

Subsequently, his silhouette, as with the athlete, narrows in shape in the central part of the body so that it encircles the car crew by its volume.

The overall design and shape of the vehicle concept acts as a tense whole ready to start, tilted towards the road - again as an athlete ready for immediate acceleration on the starting surface.

The MH2 sports concept symbolizes a unique, functional design which, in the case of the hydrogen concept car, makes it possible to achieve a drag coefficient below 0.2, which prolongs the vehicle's range itself.



All In One

Sporty, Inno vative, Elegant

A central element - a bridge - passes through the front of the vehicle through the cab to the tail of the car, the end of which is an aerodynamic diffuser. This bridge is a kind of car backbone and keeps its main components buried.

Creating a vehicle concept is a combination by applying new innovative solutions and materials to reduce the weight of the car. A significant use is also the deployment of infotainment and interface, as well as individual interactive elements of the car interior.

The interior of the car is ambient lit and connects the individual key components in the car. The inspiration is the flow of blood in the veins. With this effect, the MH2 concept comes to life and can embark on its journey.

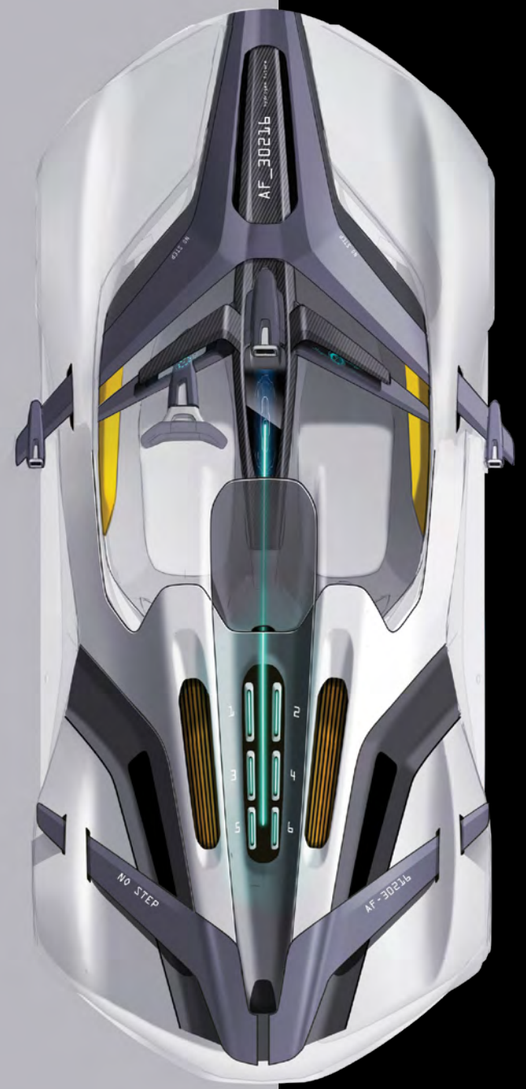
Revolutio nary **Hydrogen Technology**

The MH2 car is powered by hydrogen propulsion and a unique technology developed by the Slovak University TUKE.

The main advantage of using hydrogen in transport is the zero production of emissions during its combustion in the fuel cell. This makes this gas the fuel of the future.

Storage tank

E.g., for an alloy with a composition of La0.85Ce0.15Ni5 (type AB5), 1 MJ of heat is released when 1 m^3 of molecular hydrogen is absorbed. This heat can be used for heating or its general use is possible. When desorbing hydrogen from metal hydrides, the same amount of heat must be supplied. This requires the use of temperature management, as part of MH storage tanks, which allows heat to be removed as well as supplied.



When hydrogen is absorbed into the intermetallic structure of an alloy, heat is released, which must be removed from the reservoir. The amount of heat released depends on the type of alloy used.

Basic concept of connection of MH storage tanks

- The principle of the hydrogen storage is its absorption into the intermetallic structure of specially developed metal alloys.
- Hydrogen is stored in the atomic state, which causes an extreme pressure drop / decrease - a safety aspect.
- Research into hydrogen technologies has been carried out in Slovakia (Technical university of Košice) for more than 15 years.
- **Patented internal intensifier for MH tank heat management (PUV 50132-2020, PP 50070-2020)**
- Working pressure range: from 1 to 2.5 MPa
- Safe system for automotive
- Storage of large amounts of hydrogen without loss
- Equipped with a heat exchanger and an intensifier, which enables the removal of heat generated during refuelling


AMR
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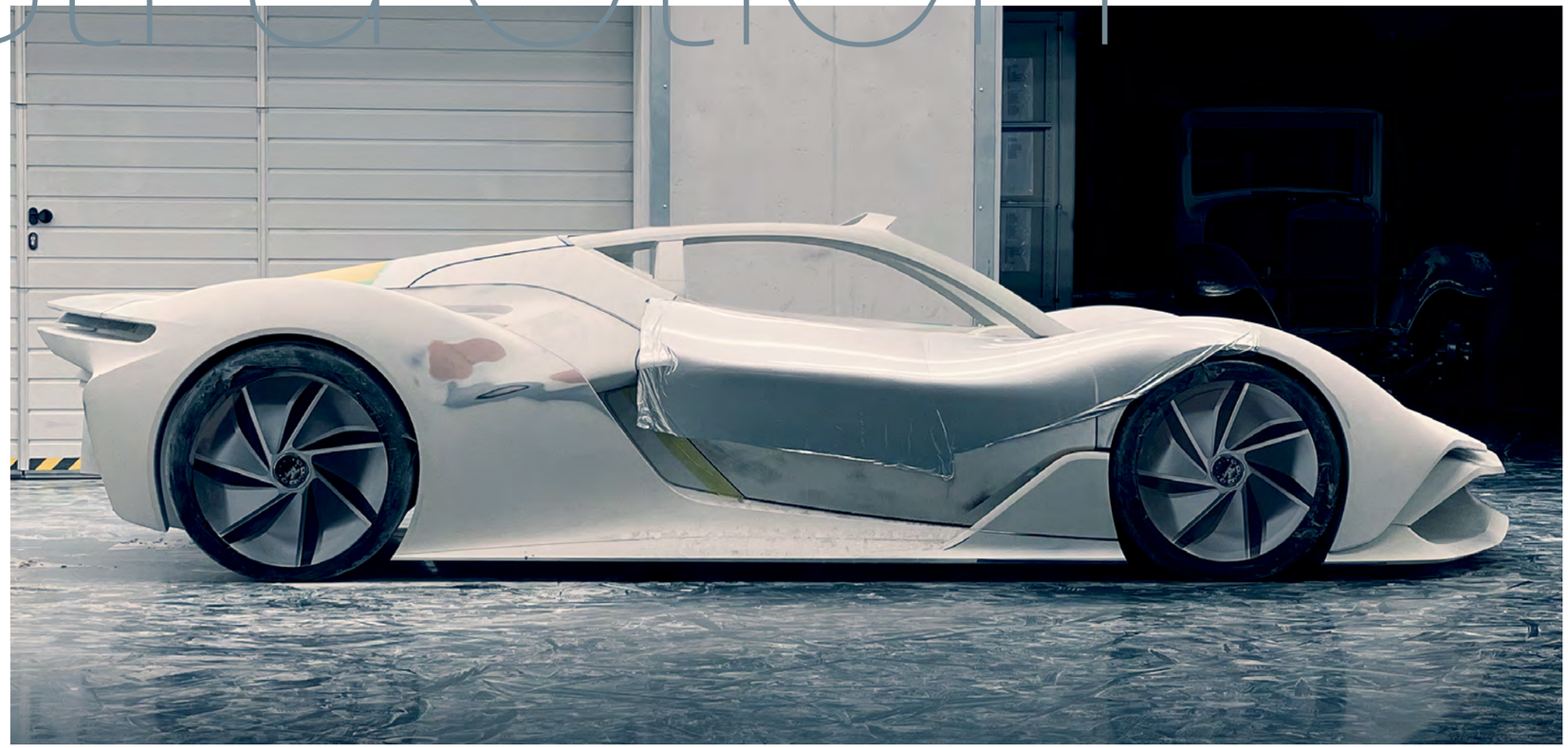
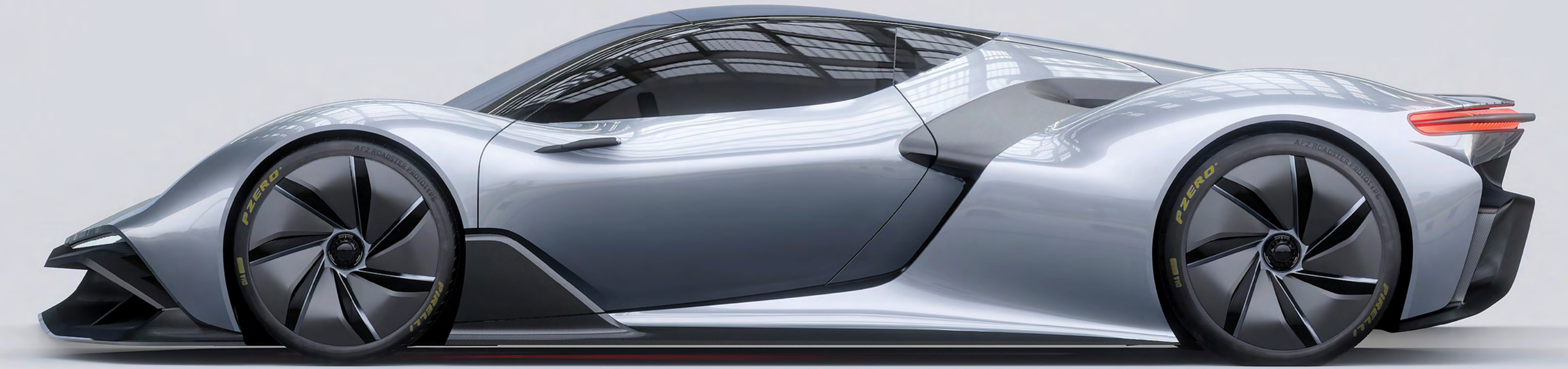
Construction



We also used modern Virtual Reality technology in the construction and design of the MH2 car.

Innovative is the general approach to methods of creating surfaces in virtual reality and in the physical model, which combines the effective creation of surfaces in a computer and at the same time their milling and verification in the physical model.

0-100km/h	Drive Train	Top Speed	Range	Emission	Power
<4s	**AWD**	**~250km/h**	**>600km**	**Zero**	**~600HP**




MH2