



EVENT HANDBOOK

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Emergency Information

MINOR INJURY

MEDICAL CENTRE – Please accompany the injured person to the medical centre. Emergency aid is provided there. The medical centre is occupied every day round the clock.

SEVERE INJURY

CALL AN AMBULANCE YOURSELF – Call an ambulance yourself if someone is severely injured and requires urgent help. The emergency number for every landline and mobile phone is 112 (also see information about emergency calls below).

DURING DYNAMICS – When the dynamic area is open, a special rescue team is on-site. To contact them, ask someone with a two-way radio (official, security).

Emergency Numbers

MAIN HOSPITAL

Department of Emergency Medicine

Address: Franje Galinca 4, 42000 Varaždin, Croatia

Phone: +385 42 262 280

Homepage: <http://www.zhm-vz.hr/>

Emergency services

In case of an emergency, please call one of the numbers listed below, no matter what time it is.

Regular emergency number:	112	0-24h
Ambulance emergency number:	194	0-24h
Firefighters emergency number:	193	0-24h
Police emergency number:	192	0-24h

BEHAVIOUR IN CASE OF REGULAR FIRES

(FUEL, OIL, PAPER, WOOD, ETC.)

Call for help (firefighters/ambulance) by either finding an official with a radio or calling 112. Assist injured people to leave the area, provide first aid if you can. Try to extinguish the fire, if it is possible, without risking your safety. If an electric consumer is on fire, first cut the power to it. Leave the area and instruct others to do so as well. Wait for the firefighters/ambulance to arrive. Handling of the situation by the firefighters, medical treatment provided by ambulance.

BEHAVIOUR IN CASE OF ACCUMULATOR FIRES

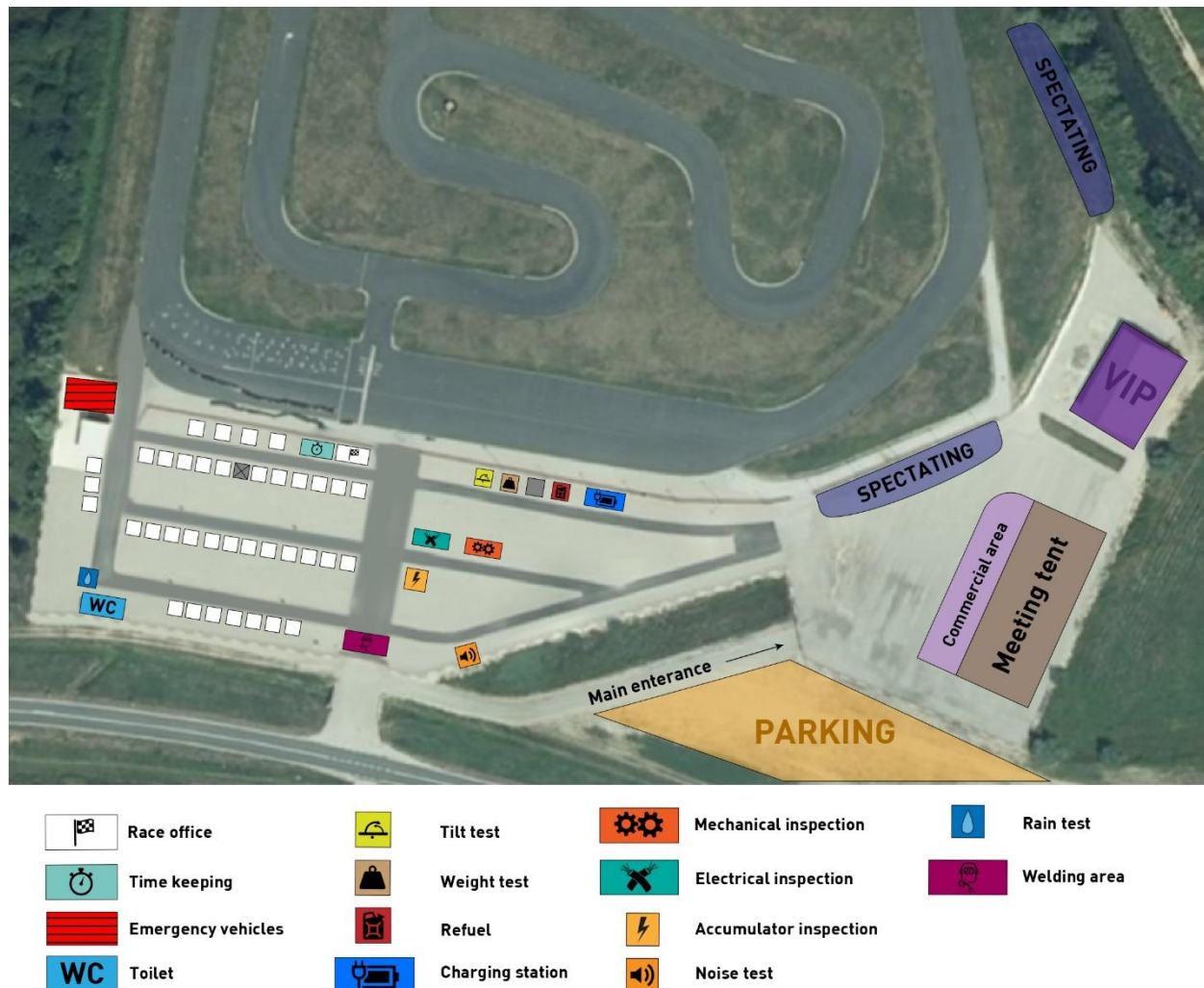
Immediately leave the area in a radius of 5 meters and instruct others to do so as well. Assist injured people to leave the area. An overheated accumulator is extremely dangerous so do not put yourself in danger by trying to put it out. Provide first aid to the injured if you can. See below section on what to do in case of electric shock - in any case, do NOT give the victim water or food. Call for help by finding an official with a radio or by calling 112 yourself. Wait for the firefighters and ambulance to arrive, who will handle the situation. Stay out of the way of fumes coming from the accumulator or the vehicle; mind the wind direction.

BEHAVIOUR IN CASE OF ELECTRIC SHOCK

Call for medical help by finding an official with a radio or by calling 112 yourself, preferably in parallel to the steps below. Push one of the emergency shutdown buttons and wait until the TSAL is switched off. Note that this can take up to 5 seconds, wait patiently. Try to talk with the victim and ask him/her about his/her health. Insulate yourself if you must move a victim away from a live contact – wear dry gloves or cover your hands with multiple layers of cloth and cover potential contact paths with the vehicle with the HV isolation blanket. Watch your footing to make sure that you do not slip or fall when trying to move the victim. Do not move the victim if there is a possibility of neck or spinal injuries unless he/she is in immediate danger. Do NOT give water or food to the victim. Give artificial respiration if the victim is not breathing. Give CPR if the victim's heart has stopped (only if you are trained in CPR) or use an Automated External Defibrillator. Cover burns with a sterile dressing. On the surface electrical burns may not look serious but the burn can be severe deeper in the tissue. Keep the victim comfortable, warm and at rest, and monitor his/her breathing until the ambulance arrives. The victim might undergo ventricular fibrillation several minutes after experiencing a shock.

Track and Accommodation

Track name: St Rauš Novi Marof (<https://goo.gl/maps/ZyzuPuDMAS7zREs88>)



THE RACING TRACK CAN BE DANGEROUS AND SERIOUS PLACE!!
EVERY PARTICIPANT HAS TO BE AWARE OF THAT AND ACCEPT AND WORK
BY PROVIDED RULES AND RECOMMENDATIONS!!

Accommodation: Campsite near the track (<https://goo.gl/maps/uo13TioJvJozFt2Z7>)

*Note: quite hours after 11 pm

Transportation: AVL Shuttle will provide transportation from and to the track

Bathroom: Portable toilets and portable camping showers

Lunch possibilities: Restaurant at the track; Cooking area

*Preparing of food is allowed only in the marked area

NOTES:

Space per team = square $14 \times 14 \text{ m} = 196 \text{ m}^2$

Walkways between camp spaces = 2 [m] width
- COVID recommended

Main walkways/Emergency exits = 5 [m] width
- completely free to move through
- emergency exits oriented to the camp exit gate

— Walkways
— Emergency exit



General Information

ARRIVAL AND REGISTRATION FOR THE EVENT

Date: Thursday, 25th August
Time: 11:00 until 18:00
Location: Karting track St Rauš Novi Marof; Race Office

After the teams arrive at Rimac FS Alpe Adria 2021 venue, volunteers will record your arrival and give you all needed information about the next steps - registration, parking, unpacking the trucks, etc.

ONLY the team captain can register his/her team. He/she can be accompanied by only ONE team member! During the first step of the registration procedure, team captains submit a printed version of the Standard Terms document signed by all team members, which we sent out to the Team Captains in advance via e-mail.

By signing the Standard Terms, the teams state that they accept the rules of the event in addition to the FS Rules, that only team members will work on the vehicle, also that they understand and will follow the safety guidelines of the event. After the registration, team captains will receive a starter package which includes event wristbands, Event Handbook, etc.

COVID-19 PREVENTIVE MEASURES

To prevent the possibility of spreading the infections during the Rimac FS Alpe Adria 2021 event it is necessary to ensure the physical distance between participants, as well as between volunteers, organizers, and other staff. The campsite will be arranged in such a manner that the physical distance of 1.5 m is maintained between each team. The number of team members may be limited.

The disinfectant will always be available for periodically disinfecting of hands. Also, it is recommended to wash hands with water and soap as often as possible.

All participants should measure their body temperature; if it is reading higher than 37.2 °C and/or if the person feels sick or experiences any symptoms (fever, cough, tiredness, aches, sore throat, diarrhoea, headache, difficulty breathing, chest pain etc), they **have to notify the team leader as well as organizers immediately** and until testing **they need to prevent contact with other participants**.

Wearing **face masks** will be compulsory at the event venue. In addition to medical masks, cloth face masks that can be washed at a minimum of 60 °C and reused can also be used.

List of Registered Teams [CV]

No.	# car number	Team name	University	Country
1.	235	UNI Maribor Grand Prix Engineering	University of Maribor	SVN
2.	111	BlueStreamline	Transilvania University of Brasov	ROU
3.	103	Silesia Automotive	Silesian University of Technology	POL
4.	50	Aixtreme Racing	University of Aachen	DEU
5.	71	Aixtreme Racing	University of Aachen	DEU
6.	12	Infinity Racing	Hochschule Kempten	DEU
7.	84	Campus Motorsport Hannover	Hochschule Hannover	DEU
8.	58	Fsracing Team	University of Mostar	BIH
9.	3	FESB Racing	University of Split	HRV
10.	229	Rennteam Uni Stuttgart	University of Stuttgart	DEU
11.	33	PRz Racing Team	Rzeszow University of Technology	POL
12.	158	UPBracing Team	University of Paderborn	DEU
13.	30	CTU CarTech	University of Prague	CZE
14.	360	Weingarten	University of Ravensburg	DEU
15.	35	Road Arrow	University of Belgrade	SRB
16.	29	KEFO Motorsport	John von Neumann University	HUN

List of Registered Teams [EV]

No.	# car number	Team name	University	Country
1.	E68	Delta Racing Mannheim electric e.V.	University of Mannheim	DEU
2.	E53	TU Graz Racing Team	Graz University of Technology	AUT
3.	E91	STUBA Green Team	Slovak University of Technology in Bratislava	SVK
4.	E54	FSB Racing Team	University of Zagreb	HRV
5.	E61	E-Motion Rennteam Aalen	University of Aalen	DEU
6.	E44	Einstein Motorsport	University of Applied Sciences Ulm	DEU
7.	E67	eForce FEE Prague Formula	Czech Technical University in Prague	CZE
8.	E45	BRS Motorsport	University of Bonn-Rhein-Sieg	DEU
9.	E113	E-Agle Trento Racing Team	University of Trento	ITA
10.	E179	Rennschmiede Pforzheim	University of Pforzheim	DEU
11.	E69	Superior engineering	University of Ljubljana	SVN
12.	E23	PUT Motorsport	Poznan University of Technology	POL
13.	E107	Bern Formula Student	University of Bern	CHE
14.	E49	High-Voltage Motorsports	Friedrich-Alexander-Universität Erlangen-Nürnberg	DEU
15.	E129	Lund Formula Student	Lund University	SWE
16.	E21	Chalmers Formula Student	Chalmers University of Technology	SWE
17.	E258	UPBracing Team	University of Paderborn	DEU
18.	E41	TU Wien Racing	TU Vienna	AUT
19.	E16	Formula Student ZHAW	ZHAW	CHE
20.	E26	Greenteam Uni Stuttgart	University of Stuttgart	DEU
21.	E94	E. Stall Esslingen	UAS Esslingen	DEU

Official Schedule

Wednesday, 25th August

- 11:00-18:00 Teams Registration and Drivers Registration @ Race Office
- 19:00-20:00 Opening Ceremony (team welcoming and basic information) @ Meeting Tent

Thursday, 26th August

- 07:30 Event Site Opens
- 08:00-08:30 Team Leaders Briefing @ Meeting Tent
- 08:30-13:00 Pre-scrutineering (Technical Inspection; all Classes) @ Pit Area
- 08:30-13:00 Mechanical Scrutineering (Technical Inspection; all Classes) @ Technical Tent
- 08:30-13:00 Electrical Scrutineering (Technical Inspection; EV only) @ Technical Tent
- 09:00-13:00 Driver Egress (all Classes) @ Pit Area
- 09:00-13:00 Tilt Test (all Classes) @ Technical Tent
- 09:00-13:00 Noise Test (CV only) @ Technical Tent
- 09:00-13:00 Rain Test (EV only) @ Technical Tent
- 11:30-12:15 Company Presentation, Rasco @ Meeting Tent
- 12:15-13:00 Company Presentation, PIA Automation @ Meeting Tent
- 13:00-14:00 Lunch Break
- 14:00-19:30 Brake Test (all Classes) @ Track Area
- 14:00-20:00 Pre-scrutineering (Technical Inspection; all Classes) @ Pit Area
- 14:00-20:00 Mechanical Scrutineering (Technical Inspection; all Classes) @ Technical Tent
- 14:00-20:00 Electrical Scrutineering (Technical Inspection; EV only) @ Technical Tent
- 14:00-20:00 Driver Egress (all Classes) @ Pit Area
- 14:00-20:00 Tilt Test (all Classes) @ Technical Tent
- 14:00-20:00 Noise Test (CV only) @ Technical Tent
- 14:00-20:00 Rain Test (EV only) @ Technical Tent
- 14:30-15:00 Company Presentation, exc.io by IBM @ Meeting Tent
- 16:15-17:00 Company Presentation, HSTec @ Meeting Tent

20:30 Pits Close

Friday, 27th August

07:30 Event Site Opens

08:00-08:30 Drivers Briefing @ Meeting Tent

08:30-13:00 Mechanical Scrutineering (Technical Inspection; all Classes) @ Technical Tent

08:30-13:00 Electrical Scrutineering (Technical Inspection; EV only) @ Technical Tent

08:30-13:00 Driver Egress (all Classes) @ Pit Area

08:30-13:00 Tilt Test (all Classes) @ Technical Tent

08:30-13:00 Noise Test (CV only) @ Technical Tent

08:30-13:00 Rain Test (EV only) @ Technical Tent

08:30-13:00 Brake Test (all Classes) @ Track Area

10:00-12:00 Practice and Engine Running Area Open @ Track Area

11:00-12:00 Vincenzo Bevilacqua, Senior Expert in Engine Analysis @ Meeting Tent

Turbocharging in Road and Race Car

11:00-13:00 Acceleration (all Classes) @ Track Area

11:00-13:00 Skidpad (all Classes) @ Track Area

12:00-13:00 Damien Favre, Performance Aerodynamics Manager, Porsche Motorsport @ Meeting Tent

Aerodynamics Development in Motorsport

13:00-14:00 Lunch Break

14:00-19:30 Acceleration (all Classes) @ Track Area

14:00-19:30 Skidpad (all Classes) @ Track Area

14:00-19:40 Engineering Design Event (all Classes) @ Pit Area

14:00-20:00 Mechanical Scrutineering (Technical Inspection; all Classes) @ Technical Tent

14:00-20:00 Electrical Scrutineering (Technical Inspection; EV only) @ Technical Tent

14:00-20:00 Driver Egress (all Classes) @ Pit Area

14:00-20:00 Tilt Test (all Classes) @ Technical Tent

14:00-20:00 Noise Test (CV only) @ Technical Tent

14:00-20:00 Rain Test (EV only) @ Technical Tent

14:00-20:00 Brake Test (all Classes) @ Track Area

14:00-20:30	Cost and Manufacturing Event (all Classes) @ Pit Area
15:00-20:30	Business Plan Presentation Event (all Classes) @ Cultural Centre “Ivan Rabuzin”
19:30-20:30	Feedback Cost and Manufacturing Event (CV only) @ Meeting Tent
20:00	Track Area Closes
21:00	Pits Close

Saturday, 28th August

07:30	Event Site Opens
08:00-08:30	Drivers Briefing @ Meeting Tent
08:30-09:00	Course Walk @ Track Area
09:00-10:00	Feedback Cost and Manufacturing Event (EV only) @ Meeting Tent
10:00-12:00	Practice and Engine Running Area Open @ Track Area
10:00-13:00	Engineering Design Event Finals (all Classes) @ Meeting Tent
10:00-13:00	Autocross (all Classes) @ Track Area
13:00-14:00	Lunch Break
14:00-16:00	Business Plan Presentation Event Finals (all Classes) @ Meeting Tent
14:00-18:00	Autocross (all Classes) @ Track Area
16:00-16:30	Juraj Majera, CEO of Tirn Technology @ Meeting Tent
<i>From R&D to Business</i>	
18:30-19:00	Formation Lap (all Vehicles) @ Track Area
19:00-19:30	Panoramic Photograph (all Teams) @ Track Area
19:30	Track Area closes
20:30	Pits Close

Sunday, 29th August

07:30	Event Site Opens
08:00-08:30	Drivers Briefing @ Meeting Tent
08:30-09:00	Course Walk @ Track Area
09:00-13:00	Endurance Event (all Classes) @ Track Area

10:00-12:00	Feedback Engineering Design and Business Plan Presentation Events (all Classes) @ Meeting Tent
12:00-13:00	Damien Favre, Performance Aerodynamics Manager, Porsche Motorsport @ Meeting Tent <i>Aerodynamics Correlation in Motorsport</i>
13:00-14:00	Lunch Break
14:00-18:00	Endurance Event (all Classes) @ Track Area
18:30	Track Area closes
Until 20:00	Moving out of the Pits
20:00-21:00	Closing Ceremony & Award Ceremony @ Meeting Tent
21:00	Farewell Party

Monday, 30th August

Until 12:00	Moving out of the RFSAA Camp
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This programme will be changed according to the number of teams

Rules and Guidelines

Everyone (participants, volunteers, and spectators) at Rimac FS Alpe Adria 2021 would like to enjoy an accident-free event! These Guidelines have been established to advise teams of potentially unsafe practices in the paddock and pit area.

BEHAVIOUR

Alcohol, illegal drugs, weapons or other illegal material are prohibited on the event site during the event. Use of motorcycles, quads, bicycles, skateboards or rollerblades in the pit area is prohibited as are self-propelled pit carts, tool boxes, tire carriers, etc.

ALCOHOL

PLEASE NOTE: Alcohol is strictly forbidden on the event site. Along with the fun of this event, we want a safe event. There will be alcohol testing (breathalysers) during the event. 0% is the allowable alcohol content during this event for everyone. If ANY team member (driver or not) is tested with an alcohol level higher than 0%, he or she will be immediately disqualified for the rest of the event. The second person of the same team caught consuming alcohol will cause the entire team to be immediately disqualified. Motorsports are dangerous. Use common sense so we can all have a safe event together! The prohibition ends with the beginning of the party on Saturday evening.

TRASH

It is the team's responsibility to keep their Paddocks clean throughout the event. There are trash can bins in the paddock and near the campsite. No trash (including broken parts, old furniture, worn-out tires or other materials) may be left behind at the end of the event.

FIRES AND SMOKING

No open fires are allowed at the event site (except for the camp and unless marked otherwise). This includes BBQ grilles, oxy-acetylene torches, heaters, cigarettes, etc. Smoking is strictly prohibited in the dynamic area, in all buildings and the pit area. Smoking is permitted only in the dedicated area around the toilet containers.

JACKING

When supporting your vehicle up off the ground you are required to use a safe, stable, load rated support device.

WORKING ON THE VEHICLE

Use of angle grinder is only allowed in the welding area. In case of using angle grinders, wear safety glasses! During the use of all electrical machines like drills or angle driver, wearing ear protection is recommended.

When using metal-cutting equipment that produces metal chips, eye protection is required for the operator as well as any team member assisting. If you are operating loud tools, hearing protection is required. **All members participating in the dynamic area and working on the vehicle must wear closed shoes.**

RUNNING ENGINES

You can run engines (IC) or put the vehicle into a ready-to-drive mode (EV) **ONLY** in the designated engine test area after passing scrutineering.

WELDING

Welding is allowed with its equipment in the welding area only using appropriate safety gear.

FUEL AND OIL

No open fuel containers are allowed. **All fuel containers must be DOT approved.** Waste oil is to be taken to the fuel station for disposal. No refuelling in the pit and the engine test area is allowed.

FIRE EXTINGUISHERS

Your fire extinguishers always must be immediately accessible. All team members must be familiar with their use. Each team must have at least two dry chemical/dry powder fire extinguishers with a minimum firefighting agent capacity of 0.9 kg. The following are the minimum accepted ratings: USA, Canada, and Brazil: 10BC or 1A 10BC; Europe: 34B or 5A 34B; Australia: 20BE or 1A 10BE. Extinguishers of larger capacity (higher numerical ratings) are acceptable. Aqueous Film Forming Foam (AFFF) fire extinguishers are prohibited. Halon extinguishers and systems are prohibited. All extinguishers must be equipped with a manufacturer-installed pressure/charge gauge. Except for the initial inspection, one extinguisher must readily be available in the team's paddock area and the second must accompany the vehicle wherever the vehicle is moved. Both extinguishers must be presented with the vehicle at technical inspection. Handheld fire extinguishers are not permitted to be mounted on or in the vehicle.

VEHICLE MODIFICATIONS

If you make any major modifications to your vehicle, it must return to scrutineering for re-approval. In any case of modification, technical inspectors will be available and monitor the modifications being made.

DRIVING PRACTICE

Driving practice is only allowed during designated times.

DRIVER'S EQUIPMENT

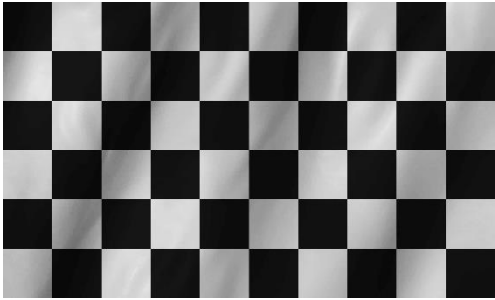
Anytime the driver is in the cockpit with the engine running, the following approved safety equipment must be worn: helmet, suit, underwear, gloves, balaclava and racing shoes (FS Rules, Rule T13.3 "Driver's Equipment").

FLAGGING

Flag signals are commands that must be obeyed immediately and without question. All drivers must know the event-flagging signals.

	<p>YELLOW FLAG</p> <p>Danger, the driver must slow down, something has happened beyond the flag station, no-overtaking unless directed by the track marshals.</p>
	<p>BLUE FLAG</p> <p>The driver should move to the overtaking area and let the faster car behind him to pass.</p>
	<p>GREEN FLAG</p> <p>The session has started. The driver may enter the track under the direction of the track marshals. In the case of stalling, the vehicle can be restarted, but the driver must await another green flag as the opening in traffic may have closed.</p> <p>The driver is clear to re-enter the track after using the slow lane to let a faster vehicle pass.</p> <p>The driver may pick up speed again after a yellow flag was displayed.</p>
	<p>RED FLAG</p> <p>The driver must come to an immediate safe and controlled stop on the track and must follow the track marshals' directions.</p>

	WHITE FLAG -Slow-moving (emergency) vehicle on the track.
	BLACK FLAG The driver must pull into the driver change area for discussion with the officials concerning an incident. A time penalty may be assessed.
	BLACK AND WHITE FLAG Dangerous driving. Warning before elimination.
	BLACK FLAG WITH ORANGE DOT Mechanical black flag. The driver must pull into the driver change area for a mechanical inspection of the vehicle.
	RED AND YELLOW STRIPED FLAG The track is slippery or something is on the racing surface. The driver must be prepared for evasive manoeuvres to avoid the situation

**CHECKERED FLAG**

The session has been completed. The driver must exit the track at the first occasion.

SPECIAL NOTE FOR DRIVERS

All drivers should do a check of critical fasteners and components on their vehicles to assure complete control during the driving events. Fasteners do come loose, parts do break due to fatigue and occasionally someone forgets to torque a nut – you will be intimately involved if this happens.

REMEMBER: USE THE KILL SWITCH in case of an engine or brake malfunction!

Technical and Safety Inspection

Vehicles must pass a Technical and Safety Inspection before being allowed to practice at the test tracks or take part in the dynamic disciplines. This means that a vehicle must have all the required inspection stickers, which are given at each step of scrutineering, in the following order:

CV	EV
Pre-scrutineering	Pre-scrutineering
Mechanical Scrutineering	Accumulator Inspection*
	Mechanical Scrutineering*
	Electrical Scrutineering
Driver Egress	Driver Egress
Tilt Test	Tilt Test
Noise Test	Rain Test
Brake Test	Brake Test

*Note: Accumulator Inspection and a part of Mechanical Scrutineering can be done simultaneously.

The event technical inspection stickers will be placed on the nose of the vehicle. Only after passing each of the relevant tests, your vehicle can compete in the dynamic events and practice at the test tracks. If a vehicle is no longer in compliance with the rules, the officials will set the vehicle's technical inspection status to fail, remove the respective inspection sticker(s) from the vehicle and note the reason for revoking the technical inspection approval in the technical inspection sheet. After technical inspection, the only modifications permitted to the vehicle are listed in FS Rules 2021 (Rule IN1.5.1 "Modifications and Repairs").

VEHICLE WEIGHING PROCEDURE: All vehicles must be weighed in ready-to-race condition. All fluids must be at their maximum fill level for weighing.

PRE-SCRUTINEERING

The following items must be presented for pre-inspection:

- All helmets
- All driver's equipment and other safety gear
- Two unused and in date fire extinguishers
- One set of four tires on rims for wet conditions
- One set of four tires on rims for dry conditions

The tire type/rim type combination presented during pre-inspection must be the same during

the whole competition. The rims for dry tires and wet tires may be different.

MECHANICAL SCRUTINEERING

Date: Thursday and Friday, 26th-27th August

Time: 08:30 until 13:00; 14:00 until 20:30

08:30 until 13:00; 14:00 until 20:30

Location: Technical Tent

Before taking part in any of the dynamic events, your vehicle must pass the Technical Inspection, which will be held in Technical Tent without previously defined order.

The following items must be presented at mechanical inspection:

- The vehicle in ready-to-race condition
- The tallest driver of the team must be in attendance for roll bar height and egress checks
- Quick jack and push bar
- SES and IAD documents and test pieces if available.

NOTE: Four team members (incl. the tallest registered driver) are allowed to enter technical inspection.

If you pass the Technical Inspection you should proceed to the other tests. If you have items that need to be rectified, the form will be returned to you (the team), you will not get your sticker and you will have to present your vehicle for scrutineering again.

Scrutineering reserves the right to spot check any vehicle at any time during the event.

ELECTRICAL SCRUTINEERING

Date: Thursday and Friday, 26th-27th August

Time: 08:30 until 13:00; 14:00 until 20:30

08:30 until 13:00; 14:00 until 20:30

Location: Technical Tent

The following items must be presented at electrical inspection:

- One ESO
- A vehicle with a mounted TS accumulator
- Quick jack and push bar
- Samples of self-designed PCBs that are part of the tractive system and are outside of the accumulator container, FS Rules (Rule EV4.3.6)
- Tools needed for the BSPD check, FS Rules (Rule T11.6.9)
- Datasheets for all parts used in the tractive system
- Accumulator container hand cart
- Tools needed for (dis-)assembly of accumulator container

- Basic tools according to FS Rules (Rule IN 3.2.2)
- Charger
- Printed datasheets for used wiring, insulation materials and high voltage components
- Laptop to display data of the AMS
- Spare samples of self-developed printed circuits with HV and LV
- Clear pictures of accumulator container and parts not reachable during the inspection.

DRIVER EGRESS

Date: Thursday and Friday, 26th-27th August

Time: 08:30 until 13:00; 14:00 until 20:30

08:30 until 13:00; 14:00 until 20:30

Location: Pit Area

PROCEDURE: All drivers must be able to exit to the side of the vehicle in less than 5 seconds, with the driver in the fully seated position, hands in the driving position on the connected steering wheel (in all possible steering positions) and wearing the required driver equipment in accordance with the FS Rules (Rule T 13.3.9). The egress time will stop when the driver has both feet on the ground.

TILT TEST

Date: Thursday and Friday, 26th-27th August

Time: 08:30 until 13:00; 14:00 until 20:30

08:30 until 13:00; 14:00 until 20:30

Location: Technical Tent

PROCEDURE: The tilt test will be conducted with the tallest driver fully strapped in the normal driving position. The tilt test will be conducted with all vehicle fluids at their maximum fill level. The vehicle will be placed on the table and tilted to 45° and 60°. There must be no fluid leaks and all wheels must remain in contact with the tilt table surface.

NOISE TEST

Date: Thursday and Friday, 26th-27th August

Time: 08:30 until 13:00; 14:00 until 20:30

08:30 until 13:00; 14:00 until 20:30

Location: Technical Tent

PROCEDURE: The sound level will be measured during a static test. The vehicle must be compliant at all engine speeds up to the maximum test speed. Teams must bring a laptop to indicate the engine speed measured by the Electronic Control Unit (ECU). Measurements will be made with a free-field microphone placed free from obstructions at the exhaust outlet level, 0.5 meters from the end of the exhaust outlet, at an angle of 45° with the outlet in the horizontal plane. Where more than one exhaust outlet is present, the test will be repeated for each exhaust and the highest reading will be used. If the exhaust has any form of active tuning or throttling device or system, it must be compliant with the rules in all positions. Manually adjustable tuning devices must require tools to change them and must not be moved or modified after the noise test is passed. The position of the device must be visible to the officials and manually operable by the officials during the noise test. The test will be run with the gearbox in neutral. During this test, the vehicle must be jacked up using the quick jack. After passing the noise test the function of the master switch, the cockpit-mounted shutdown button and the inertia switch will be tested. After passing, the airtightness of the intake system will be tested by closing off the inlet after which the engine must stall.

RAIN TEST

Date: Thursday and Friday, 26th-27th August

Time: 08:30 until 13:00; 14:00 until 20:30

08:30 until 13:00; 14:00 until 20:30

Location: Technical Tent

PROCEDURE: The vehicle must be in a ready-to-race condition. All components and constructions used to protect the vehicle from water during the rain test must be used during the entire event. The tractive system must be active during the rain test. The vehicle must be jacked up using the quick jack, and all driven wheels must be removed. The vehicle must not be in ready-to-drive mode. The test will be conducted without a driver. Water will be sprayed at the vehicle from any possible direction. The water spray is like a vehicle driving in rain and not a direct high-pressure stream of water. The test is passed if the IMD is not triggered while water is sprayed at the vehicle for 120 s and 120 s after the water spray has stopped.

BRAKE TEST

Date: Thursday and Friday, 26th-27th August

Time: 08:30 until 13:00; 14:00 until 20:30

08:30 until 13:00; 14:00 until 20:30

Location: Track Area

CONCEPT: Brake Test checks that the vehicle can be brought to a controlled stop. Each driver must know the proper procedure of the Brake Test.

PROCEDURE: With the vehicle at the start line of the station a green flag should be used to signal the start of each run. The driver must accelerate on a short straight (typically getting into 2nd gear) until reaching the braking area, which is a box defined by cones. After accelerating, the tractive system must be switched off by the driver and the driver must brake using only the mechanical brakes. It is acceptable for the TSAL to switch to green shortly after the vehicle has come to a complete stop as the reduction of the system voltage may take up to 5 seconds. Once inside the box, driver must apply the brakes with enough force to demonstrate full lock-up of all four wheels at the same time. If the vehicle passes the test, the person in charge signs the approval form and provides the team with the last tech sticker. The vehicle is now free to proceed to the practice track or the dynamic events.

NOTE: If the vehicle is unable to pass the brake test in two attempts, the vehicle must be repaired and then brought back for retesting. Re-certification may be required if work is performed on the vehicle's brake system or if the vehicle is involved in an incident that results in vehicle damage.

Dynamic Events

GENERAL INFORMATION

The dynamics at Rimac FS Alpe Adria 2021 are compliant with the FS Rules 2021 and additional Rimac FS Alpe Adria 2021 Rules. The following pages describe the additional procedures and key aspects. Other information will be provided at the briefings on site.

TEAM LEADERS AND DRIVERS BRIEFINGS (all Classes)

Team leaders briefing will be held at the Meeting Tent at 08:00 on Thursday. Drivers briefings will be held at 08:00 on Friday, Saturday and Sunday. All drivers for that day and team captains must attend. The briefing contains general event information and detailed information about the dynamic events of the day.

Each team must register at least three drivers. The drivers must be registered and show a valid driving license. Before the event, teams need to send copies of the driving license for all registered drivers. An individual driver may not drive in more than three dynamic events.

ACCELERATION (all Classes)

DATE: Friday, 27th August

TIME: 14:00 until 20:30

LOCATION: Track Area

POINTS: 75

EVENT CONCEPT: The objective of the Acceleration Event is to evaluate the vehicle's demonstrated acceleration capability by measuring the elapsed time required for the vehicle to travel 75m from a standing start. The event is designed to focus on engine performance and on the suspension's ability to maximize tire grip.

EVENT FORMAT: Each team has four runs driven by two drivers with two runs each. Starting order is based upon the time of arrival. Teams on their first run will receive priority. Elapsed time will be recorded for each acceleration run. Any penalties will be assessed to the acceleration run during which the penalty occurred. The fastest corrected elapsed time (including penalties) of the completed acceleration runs will be used to calculate the score for each vehicle.

EVENT PROCEDURE: Stage your vehicle in the appropriate staging line for either driver 1 or driver 2. Vehicles in the driver 1 staging line will be given priority. Drivers must be properly belted into the vehicle with all required safety equipment installed as directed by the event workers before the vehicle is first in line to start an acceleration run. An event worker will direct the driver to approach the start line. Vehicles will be staged approximately 0.3m (1 ft) behind the start line.

The driver is permitted to start an acceleration run only when the event worker waves the green flag. Timing will start when any part of the vehicle crosses the start line. The acceleration run is counted (one of the permitted accelerations runs) when any portion of the vehicle crosses the start line.

Timing will end when the vehicle crosses the finish line located 75m from the start line. The finish line is marked with a checkered flag.

Each driver can choose to drive one or two runs in a row. The second run may be performed immediately after the first run without stepping back to the end of the queue.

SKIDPAD (all Classes)

DATE: Friday, 27th August

TIME: 14:00 until 20:30

LOCATION: Track Area

POINTS: 75

EVENT PROCEDURE: Each team has four runs, driven by two drivers with two runs each. Each driver has the option to make a second run immediately after their first run. The starting order is based on the time the team arrives at the Skidpad Event. Teams on their first run will receive priority. A green flag is used to indicate that the driver may start. The vehicle will enter perpendicular to the figure and will take one full lap on the right circle to establish the turn. The next lap will be on the right circle and will be timed. Immediately following the second lap, the vehicle will enter the left circle for the third lap. The fourth lap will be on the left circle and will be timed. Immediately upon finishing the fourth lap, the vehicle will exit the track perpendicular to the figure of eight and moving in the same direction as entered.

AUTOCROSS (all Classes)

DATE: Saturday, 28th August

TIME: 10:00 until 13:00; 14:00 until 18:30

LOCATION: Track Area

POINTS: 100

EVENT PROCEDURE: The Autocross Event is designed to test the vehicle's handling qualities without the hindrance of competing vehicles. Each team has up to four runs, driven by two drivers with two runs each. The vehicle is staged at a staging line before the starting line. A green flag is used to indicate that the driver may start. Timing starts only after the vehicle crosses the starting line and stops after it crosses the finish line. The starting order is based on the time the team arrives at the Autocross Event. Teams on their first run will receive priority. The fastest of the runs completed, including penalties, will be used to calculate the team score. After a driver's first run, the driver has the option of taking the second run immediately or leaving the staging area and running later in the heat. If a vehicle fails during a driver's first run, vehicle repairs can be made to the vehicle and the driver can return to complete the second run.

NOTE: Once the vehicle passes the start timing line, the run has been officially attempted and cannot be re-started. If the vehicle stalls before triggering the timing lights, it can be pushed back for a re-start. This is only allowed once. If the vehicle demonstrates the difficulty in launching, it will need to be pulled away and repaired.

ENDURANCE AND EFFICIENCY (all Classes)

DATE: Sunday, 29th August
TIME: 09:00 until 13:00; 14:00 until 18:00
LOCATION: Track Area
POINTS: 325 + 100

PURPOSE: The goal of endurance is to test the durability of the vehicles. The dual nature of the event can lead to compromises, while the course layout and 22 km length of the event test the vehicle's durability.
Note: No repairs or work may be performed on the vehicle during the event (except for tire changes due to weather conditions and to accommodate the second driver). There is only one run for the endurance event.

DESCRIPTION: This discipline represents the main challenge for all drivers. The winner of the Endurance race has the most chances to win the event. The event is approximately 22 km. The first driver enters the track and after finishing 11 km goes out to the place predicted for drivers' exchange. The maximum time predicted for this change to happen is three minutes. After that time expires, the second driver enters the track and drives 11 km before exiting. The colour of the cones is the same as in the Autocross Event. Starting order for the Endurance Event is the reversed order from Autocross times where the best time starts last on Endurance. The starting order will be displayed in the Information Table. No refuelling is allowed during the event.

NOTE: According to the experience of earlier years Formula Student events, it is expected to have a sudden need for new teams in the waiting queue in the first section of the Endurance Event due to early DNFs. Please be prepared to attend the queue on time!

Vehicles that successfully finish Endurance and those that make it past the driver change must report to the scrutineers. They will stay there until passing the post-endurance scrutineering.

The event officials reserve the right to adjust the run order as necessary during the event to maintain safe operations and the flow of the event.

ENDURANCE PROCEDURES: The team must have its fully fuelled vehicle in the staging/prep area at the appointed time. Only two crewmembers, alongside the first driver, are allowed in the staging area for the vehicles. When the vehicle is called to the staging line, the team must push the "race ready" vehicle with the driver completely belted into the staging line. Once the vehicle is pushed to the staging line, it cannot be touched by any team member except the driver in the vehicle. The only tools allowed in the possession of the team members, at the staging line, are those needed for driver seating adjustment during the driver change. No laptops, pressure gauges, baffles, tire wraps, etc. will be allowed at the staging line. Nothing can be brought to the starting line that is not intended to stay on the vehicle. When there is a space for the

vehicle on the course and the timing/scoring system is set, the first driver will be motioned to the starting line. The person staging the vehicles is not obligated to give teams any advance notice before entering the track. An official will perform a safety check of the vehicle and the driver restraint system. The starter will stage the vehicle's front tires at the beginning of the entrance to the track. When there is an opening on the track, the course marshal (starter) will wave the green flag, signalling the go-ahead for the driver to start. If the vehicle stalls, the driver must wait for another green flag before being allowed on the course.

Note: If the vehicle cannot be restarted, the team members must move the vehicle away from the staging area. If a team running out of order has a vehicle that stalls and cannot be restarted at the entrance to the track, the vehicle will be deemed disabled and will be disqualified from the event.

On the last lap of the first driver, a checkered flag will be displayed directing the vehicle to exit to the driver change area. It is the driver's responsibility to correctly exit the track; any person directing the vehicle off the course is an additional aid only. Only three team members (including drivers) are allowed in the driver change area at once. After the vehicle arrives in the driver change area, the team has three minutes to get the second driver belted in and driving out of the driver change area. Only adjustments to fit the second driver (or weather-related tire changes) may be performed on the vehicle. No other work is allowed.

When the second driver is ready, the vehicle should be slowly driven to the starting line queue. An official will perform a safety check of the vehicle and the driver restraint system. The course marshal will stage the vehicle's front tires at the beginning of the entrance to the track. When there is an opening on the track the course marshal will wave a green flag signalling the go-ahead for the driver to start. If the vehicle stalls, the driver must wait for another green flag before being allowed on the course.

Note: If the vehicle cannot be restarted without external assistance, the vehicle will be deemed disabled and will be disqualified from the event.

Upon completing the last lap with the second driver, the checkered flag will be displayed and the vehicle will exit the course and will be directed to the box. After leaving the track, the vehicle must be powered down.

PASSING: Overtaking is only permissible in the designated passing zones and under the control of the track marshals. Passing zones have two parallel lanes; a slow lane only used by the vehicles that are being overtaken and a fast lane for the vehicles that are overtaking. Passing zones may be situated on either the left or right of the fast lane. The passing zone procedure will be as follows: a slower leading vehicle will be shown the blue flag and must drive into the slow lane and decelerate; the following faster vehicle will continue in the fast lane to pass the slow vehicle; the vehicle that has been overtaken may re-enter the track when the track marshal who is in charge of that passing zone is showing the green flag. The passing rules do not apply to vehicles that are stopped on track or vehicles that have spun out and are not moving. When passing a stationary vehicle, it is critical to slow down, drive cautiously and follow the instructions from the track marshals.

EFFICIENCY PROCEDURE [CV only]: Efficiency is measured after the endurance event. Only vehicles which score points in the endurance event will receive points for efficiency. Teams whose fuel volume used during the endurance event exceeds 26 l=100km receive zero points for fuel-efficiency. Teams whose uncorrected elapsed endurance time exceeds 1:333 times of the uncorrected elapsed time of the fastest vehicle receive zero points for efficiency. Fuel pumps will be turned on and fuel valves will be opened to ensure complete refuelling.

EFFICIENCY PROCEDURE [EV only]: Energy efficiency is measured during the endurance event. The endurance energy is calculated as the time-integrated value of the measured voltage multiplied by the measured current logged by the data logger. Regenerated energy is multiplied by 0.9 and subtracted from the used energy. Only vehicles which score points in the endurance event will receive points for efficiency. Teams whose uncorrected elapsed endurance time exceeds 1.333 times of the uncorrected elapsed time of the fastest vehicle receive zero points for efficiency.

The Post Event Technical Inspection must be passed to score points in the endurance event.

**NO MOTORIZED VEHICLES ARE ALLOWED ON THE COURSE EXCEPT DURING THE EVENT ITSELF.
VIOLATORS OF THIS POLICY MAY BE DISQUALIFIED FROM THE EVENT.**

Static Events

ENGINEERING DESIGN EVENT (all Classes)

DATE: Friday, 27th August
Finals Saturday, 28th August

TIME: 14:00 until 19:40
Finals 10:00 until 13:00

LOCATION: Pit Area
Finals @Meeting Tent

POINTS: 150

OBJECTIVE: The concept of the Design Event is to evaluate the students' engineering process and effort that went into the design of a vehicle, meeting the intent of the event. Proprietary components and systems that are incorporated into the vehicle design as finished items are not evaluated as a student-designed unit but are only assessed on the teams' selection and application of that unit.

PROCEDURE: At the event, teams will present their knowledge and their vehicle to the judges, which will evaluate the teams' performance following the design objectives. Each judging group will include one expert from the following fields: Aerodynamics, Chassis and Ergonomics, Electrical and Control Systems, Overall Vehicle Concept and Management, and Powertrain. Teams may bring any photographs, drawings, charts, spare parts, or other material that they believe are supportive of the design event, but the space provided for design judging may be limited. The evaluation process will take 25 minutes with 5 minutes for judges to sum up all comments and 5 minutes break between each team.

[EV ONLY] Only sealed accumulator containers which passed the accumulator inspection may be presented or mounted in the vehicle. They must not be opened.

[EV ONLY] Only fully discharged and electrically shortened spare accumulator cells or spare stacks may be presented.

VEHICLE CONDITION: Vehicles must be presented for design judging in finished condition, fully assembled, complete and ready-to-race. Vehicles may be presented for design judging without having passed technical inspection. Covers and/or parts may be removed during the design judging to facilitate access and presentation of components or concepts.

JUDGING CRITERIA: The judges will evaluate the engineering effort based on questions and an inspection of the vehicle. The judges will inspect the vehicle to determine if the design concepts are adequate and appropriate for the application. The judges may deduct points if the team cannot adequately explain the engineering and construction of the vehicle.

SCORING: The overall Engineering Design Event maximum scoring is 150 points for all classes.

COST AND MANUFACTURING EVENT (all Classes)

DATE: Friday, 27th August

TIME: 14:00 until 20:30

LOCATION: Pit Area

POINTS: 100

OBJECTIVE: The objective is to evaluate the team's understanding of the manufacturing processes and costs associated with the construction of a prototype race car. This includes trade-off decisions between content and cost, make or buy decisions and understanding the differences between prototype and mass production.

PROCEDURE: Before the event, three Cost Report Documents (CRD) must be submitted to the event website by the deadline specified on the event website. During the event, a 25-minute-long discussion with the judges will take place, next to the team's vehicle. The discussion is split into two parts:

Part 1 "Bill of Material (BOM) Discussion":

A discussion to evaluate the team's ability to prepare an accurate engineering and manufacturing BOM for the complete vehicle. The team must prove the following:

- The specification of the vehicle in the CRD accurately reflects the vehicle brought to the event
- The costs within the Costed Bill of Material (CBOM) part of the BOM are correct and realistic
- The manufacturing feasibility of the vehicle.

Part 2 "Cost Understanding":

A discussion to evaluate the general cost and manufacturing knowledge of the team. Teams must present their vehicle at the designated time to the judges. Teams that miss their time slot will lose all cost points for that day. Teams can bring electronic, handwritten or printed handouts, flip charts or similar to the event, but the space available may be limited.

Cost Report Documents (CRD): The CRD consist of the following documents:

- The BOM including DBOM and CBOM created online on the FSG website
- The supporting material file uploaded as a pdf file to the event website
- The cost explanation file uploaded as a pdf file to the event website.

Changes to the CRD will not be permitted after the deadline. A changelog of the changes on the vehicle since the submission deadline of the CRD can be presented at the BOM discussion to the judges. Missing parts of the BOM cannot be part of the changelog. All CRD must be brought either as a hard copy or digital version to the event discussion. The website tool will provide a printable pdf version of the BOM. A hard copy must be in a ring binder with DIN A4 pages (or similar). The team must ensure that two judges can

review the CRD independently. The presented CRD must be identical to the uploaded versions, otherwise, five penalty points will be deducted from the team's cost event score.

Bill of Material (BOM): The BOM is a sorted list for every vehicle part. The BOM must list all parts and equipment fitted to the prototype vehicle at any time during the event. The BOM is structured according to FS Rules (Section 2.4).

Detailed Bill of Material (DBOM): The manufacturing processes of all parts from two or three BOM systems specified in the event handbook must be listed in the DBOM. Additional to the BOM, the DBOM have to include everything listed in FS Rules (Section 2.5). DBOM for the "Suspension System" must be submitted for RFSAA21.

Costed Bill of Material (CBOM): The actual costs of the prototype vehicle as presented have to be included for one or two BOM system(s) specified in the event handbook. The cost calculations must include the costs of materials, fabrication bought parts and assembly to the vehicle and must be completed as realistically as possible. The cost calculations have to be done according to FS Rules (Section 2.6). CBOM for the "Electrical System" must be submitted for the RFSAA21.

Supporting Material File: The supporting material file is a document containing additional information which allows the judges to understand the BOM. It should include drawings, exploded view drawings and/or pictures of the vehicle and the parts included in the BOM.

Cost Explanation File: The cost explanation file is a document containing additional explanations, which allow the judges to understand the costs within the CBOM part of the BOM. The cost explanation file should point out which cost model was used and which types of costs are included. It should also contain which specific cost figures were used, e.g. the cost of one machine operation hour.

Cost and Manufacturing Vehicle Condition: Vehicles must be presented for cost and manufacturing judging in finished condition, fully assembled, complete, ready-to-race and with its dry tires mounted. The judges will not evaluate any vehicle that is presented at the cost and manufacturing event, in what they consider to be an unfinished state and will award zero points for the entire event. Vehicles may be presented for judging without having passed the technical inspection, even if final tuning and setup is in progress. Covers and/or parts may be removed during the judging to facilitate access and presentation of components or concepts.

BUSINESS PLAN PRESENTATION EVENT (all Classes)

DATE: Friday, 27th August

Finals Saturday, 28th August

TIME: 15:00 until 20:30

Finals 14:00 until 16:00

LOCATION: Cultural Centre "Ivan Rabuzin", Ulica Antuna Mihanovića 5, 42220 Novi Marof

Finals @Meeting Tent

POINTS: 75

OVERVIEW: After a year of planning, fabricating and testing a new prototype vehicle, the team aspires to sell their vehicle design to a make-believe racing manufacturer/investor. The competitors will be judged on their ability to create and deliver a presentation that clearly explains the merits of their package.

The presentation must relate to the vehicle entered into the Rimac FS Alpe Adria 2021 Event, although the state of the prototype itself must not be considered (this means even if the vehicle is not working or finished, at this static event it does not matter).

THE PRESENTATION: Competing teams must keep a presentation to potential investors or partners for the presented business model. The presentation should tie together all factors that would influence the marketability and manufacturability of their design and all risks conjuring this business idea. The technical aspects of the vehicle design should be presented to reinforce or support performance claims but should be reduced to the minimum necessary for an investment decision. The competitors should show an understanding of the marketplace and the targeted customer. Furthermore, they should show how their design fits into its expected market and how it is completed to a business model. Competitors must convince the Judges that their prototype and the related concept represents a profitable enterprise for the manufacturer/investor and that is simply an attractive investment.

PROCEDURE: Presentations are limited to a maximum of ten minutes. The judges will stop any presentation exceeding ten minutes. The presentation will not be interrupted by questions. Immediately following the presentation, there will be a five-minute-long question-and-answer session. One or more team members may present the business plan. All team members involved in the BPP must be in the podium area and must be introduced to the judges at the beginning of the presentation. The team members who have been introduced may answer the judges' questions even if they were not presenting. Teams that fail to make their presence within their assigned time will receive zero points for the BPP.

JUDGING PROCESS: The judging at the event will start with initial judging where all teams are judged by different judging groups. The top teams are then judged by all business judges in the BPP finals.

SCORING: The scoring of the BPP is based on the average of the scores given by each of the judges. The scoring for the non-finalist is calculated according to FS Rules (Rule S1.4 "Business Plan Presentation Scoring").

RFSAA Officials

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At the venue, we will answer your questions directly. To contact us before and after the event, please write to us via

 info@fs-alpeadria.com

 <https://fs-alpeadria.com/>

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