

MY27 Sidepods **CoDR**

10/03/2026

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because racecar.

From ArchDR and Last Year

- Mounting split into two decisions: radiator mount and sidepod-shell mount are now picked separately (ArchDR had one floor-mounted unit), possible concern on floor-thickness
- Last Year's Design: Sidepods are the same mold as floor
- Wet layup is the baseline; prepreg only as an upgrade (ArchDR feedback)
- Have to succeed against FSAE 2027 rules: firewall / line of sight to cooling (T.1.8), plain-water coolant (T.5.4.2), ride-height opening (V.1.4.2)



System Interfaces (everyone)

System (Name the RE)	What you need from them (due date)	What they need from you (due date)
Frame (Nichollas)	Frame layout (11/15/26)	Mounting tab locations
Aero mounting (FatemeH)	Mounting components	CFD, wing characteristics (ie. size, weight, ribs / stiffness sensitivities), ground clearance adjustability ranges, forces Ruby - manufacturing ops
Composites (Calvin)	Prepreg send out date Tooling board? Gel coat & other possible mold finishing items	Plans for prepreg components
Cooling (Shinyoung)	Radiator positioning (mounting for FatemeH) Radiator sizing bounds	Mass flow numbers



Functional Requirements:

Requirement	Description	Target	Source
Heat rejection	Heat each radiator must reject at worst-case endurance	$\geq 2.34 \text{ kW}$ per core	ArchDR slide 19
Air mass flow	Air through each core	$\geq 0.17 \text{ kg/s}$ (assuming 3.4 m/s face)	StarCCM+ simulation
Aero Package	Sidepods support the full-car targets	Car $Cl_A 4.0 \pm 0.2 \text{ m}^2$, $CdA 1.3 \pm 0.1 \text{ m}^2$	ArchDR FR table
Service time	Remove one sidepod without opening the cooling loop	$\leq 5 \text{ min}$ per side (10 min OK)	ArchDr slide 17

Functional Requirements:

Requirement	Description	Target	Source
Mount stiffness	Pod/element deflection at max aero load	≤ 3 mm at 30 m/s	T.7.1.3 rigidity, IN.6.2 push test
Mass	Sidepod pair + brackets (no radiator)	Within the sidepod share of the 14.22 ± 0.25 kg aero budge	ArchDR Mass sheet
Added floor thickness	Floor thickness added by pod/radiator mounts	0 mm (≤ 1 mm) so nothing	ArchDR: floor thickness $\rightarrow$ CG; floor is already $\sim +6$ mm

Design Constraints

- Sidepods count as Aero Devices: ≤ 500 mm above ground (T.7.2.2, T.7.7.1.b)
- Plan view: inboard of the line joining front/rear tire outer faces (T.7.6.2)
- Forward-facing edges: radius ≥ 5 mm (horizontal), ≥ 3 mm (vertical) (T.7.1.4)
- Rigid when static, no oscillation; may be push-tested at tech (T.7.1.3, IN.6.2)
- Nothing in the 75 mm tire keep-out; tires visible from the side (V.1.1)
- Firewall between driver and radiator/lines; no line of sight (T.1.8.1–2)
- Coolant must be plain water or oil (no glycol) (T.5.4.2)
- Opening to measure lower-SIS ride height without removing aero (V.1.4.2.a)
- If ≤ 100 mm from HV parts: ground it (metal < 300 m Ω , carbon < 5 Ω) (EV.7.7)

Design Constraints

- Fit between front and rear tires at full steer and bump
- Clear suspension links, HV/LV harness and the accumulator
- Radiator and cooling loop stay installed and sealed when a sidepod or the floor comes off
- Every fastener reachable with hands + standard tools
- All mounts visible at tech inspection
- Hoses near the driver insulated from the cockpit (T.1.6.3)

Soft Requirements

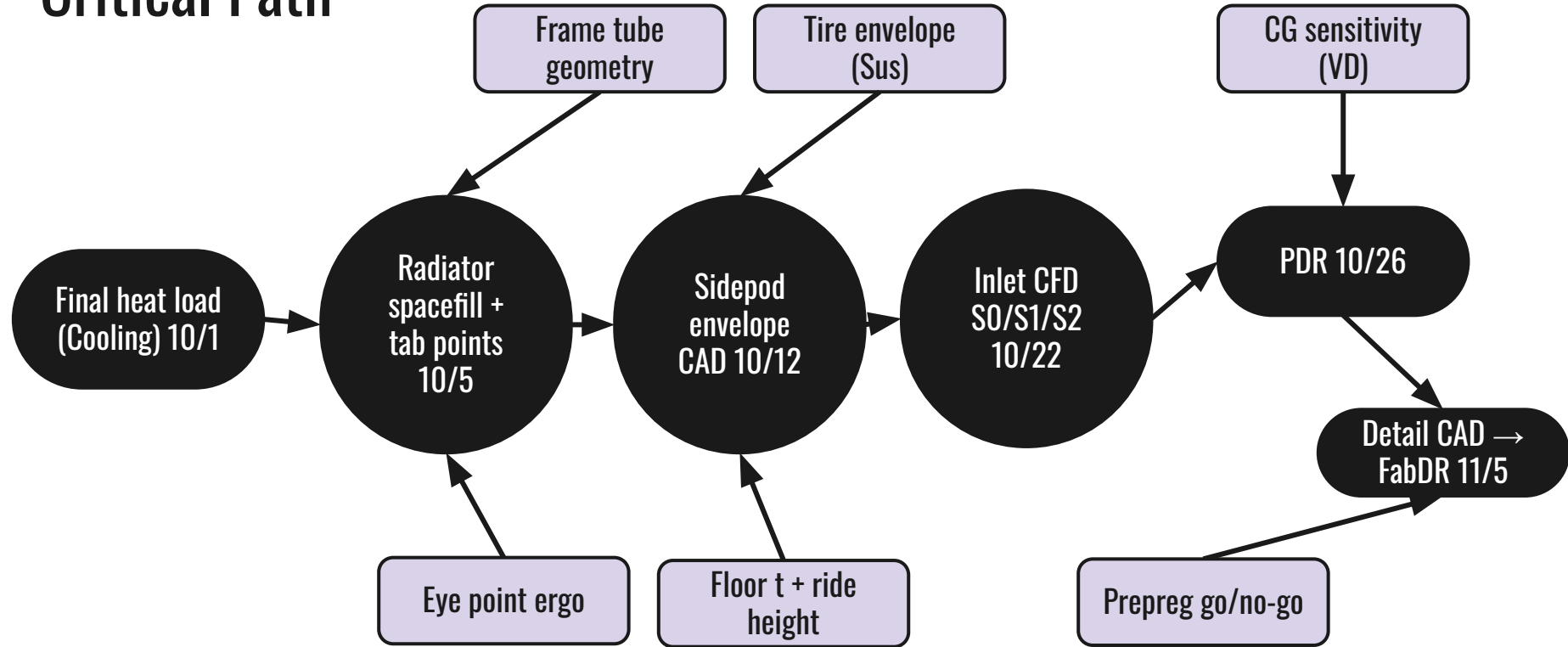
- Look good: continuous surfaces, clean livery area, no exposed hardware on top (ArchDR: "want to look good this year")
- Design for wet layup with Sigmalex; prepreg only if timeline & shell concept
- Wrapped-foam elements considered for the airfoils (ArchDR feedback)
- One hex key for every sidepod fastener; no custom tools
- Poka-yoke: left/right side pods and brackets cannot be swapped
- Manufacturable in-house: foam/MDF plugs, wet layup

Risks and Unknowns

- Manufacturing timeline
- Aero mounting delay
- Interference with other systems
- Radiator visible to driver (T.1.8.2)
- Leakage at the pod-to-core seal



Critical Path



Timeline Milestones

October - Early Nov

- 10/1** Final heat load from Cooling
- 10/5** Spacefill / radiator tab points due
- 10/8** CoDR
- 10/22** Inlet CFD (S0/S1/S2) done
- 10/26** PDR; order radiators + fans
- 11/5** FabDR

Nov - Early Dec

- 11/15** OML freeze
- 11/20** CDR
- 11/23** Design freeze
- 11/30** Scrutineering complete
- Early Dec** Molds + layups