

MAHOSHA SANDARU KABALLAMURU

Aerospace and Space Engineering Portfolio

Graduate and trainee engineering opportunities

Aerospace engineering and systems engineering development pathways

CURRENT ROLE

Aerospace / Mechanical Quality Inspector

Industrial Gas Springs (Barnes Group Inc.), Mitcham | December 2025 to present

01

QUALITY

Inspection, FAIR reporting and traceable evidence in an AS9100 and ISO 9001 environment.

02

SPACE MATERIALS

Undergraduate research into lunar simulant composites and compression testing.

03

AIRCRAFT DESIGN

Glider tail design, SolidWorks modelling and team flight testing.

EDUCATION

BSc (Hons) Aerospace Engineering, Kingston University

Upper Second Class Honours (2:1), awarded 12 June 2025. Taught in collaboration with Asian Aviation Centre, Sri Lanka.

INTERACTIVE WORK SAMPLE

Mission Readiness: a browser challenge in spacecraft configuration, inspection and verification planning.

01 / INDUSTRY

Industry experience

Inspection, manufacturing documentation and practical engineering

PRECISION

Measurement and conformance

Shadow gauge
Trimos Altia height gauge
Callipers and micrometres
Thread and plug gauges
Spring force and K-factor testing

QUALITY SYSTEMS

AS9100 Rev D
ISO 9001:2015
Calibration records
Fault reporting

EDUCATION / S2

2:1

BSc with Honours Aerospace Engineering

Kingston University
with Asian Aviation Centre, Sri Lanka

Awarded 12 June 2025

Aerospace / Mechanical Quality Inspector

Industrial Gas Springs | Mitcham

DEC 2025 - PRESENT

Carry out first-off and final inspection against drawings and tolerances. Record actual component dimensions in First Article Inspection Reports and produce inspection and test reports.

Inspect raw material and surface finish, test spring force and K factor, maintain calibration records and report faults for correction.

Aerospace Assembly Technician

Honeywell Aerospace Wheels and Brakes | Feltham

AUG 2025 - DEC 2025

Worked on wheel and brake overhaul, part inspection, hub assembly and tyre mounting using maintenance documentation, Vernier callipers and torque wrenches. Followed FOD and tool-control procedures.

Mechanical Technician

Autosolutions Automotive Electronics Ltd | Croydon

SEP 2024 - JUL 2025

Diagnosed electric and hybrid vehicle faults using schematics, multimeters and oscilloscopes. Supported calibration and system debugging.

Trainee Engineer

Lakwin Aviation | Sri Lanka

JAN 2023 - AUG 2024

Supported maintenance planning and mechanical, hydraulic, pneumatic, electrical and avionics work using maintenance manuals and calibrated tools.

Career duties and dates follow the recent CV S1. Working within a quality system does not denote personal certification.

02 / SPACE MATERIALS

Lunar materials research

Laboratory investigation of composites for in-situ resource utilisation



Compression tooling and specimen release.
Original report S3 page 22.

ENGINEERING QUESTION

How do lunar simulant composites carry load?

I investigated laboratory specimens made from LHS-1 lunar simulant, sand and epoxy binder as precursors for future ISRU construction research.

MY CONTRIBUTION

Prepared nominal 40 g specimens using compression tooling and oven curing, recorded specimen dimensions and mass, and compared compression-test results.

Examined fracture observations and SEM imagery with university specialist support, connecting preparation, test documentation and interpretation.

MATERIALS AND METHODS

LHS-1 simulant, sand and epoxy
Mass balance and callipers
Zwick/Roell Z050 compression testing
Fracture observations and SEM imagery

Dr Peter Shaw: supervision. Dean Wells: fabrication and testing guidance.
Simon Crust: SEM support. Dr Doni Daniel: interpretation advice.



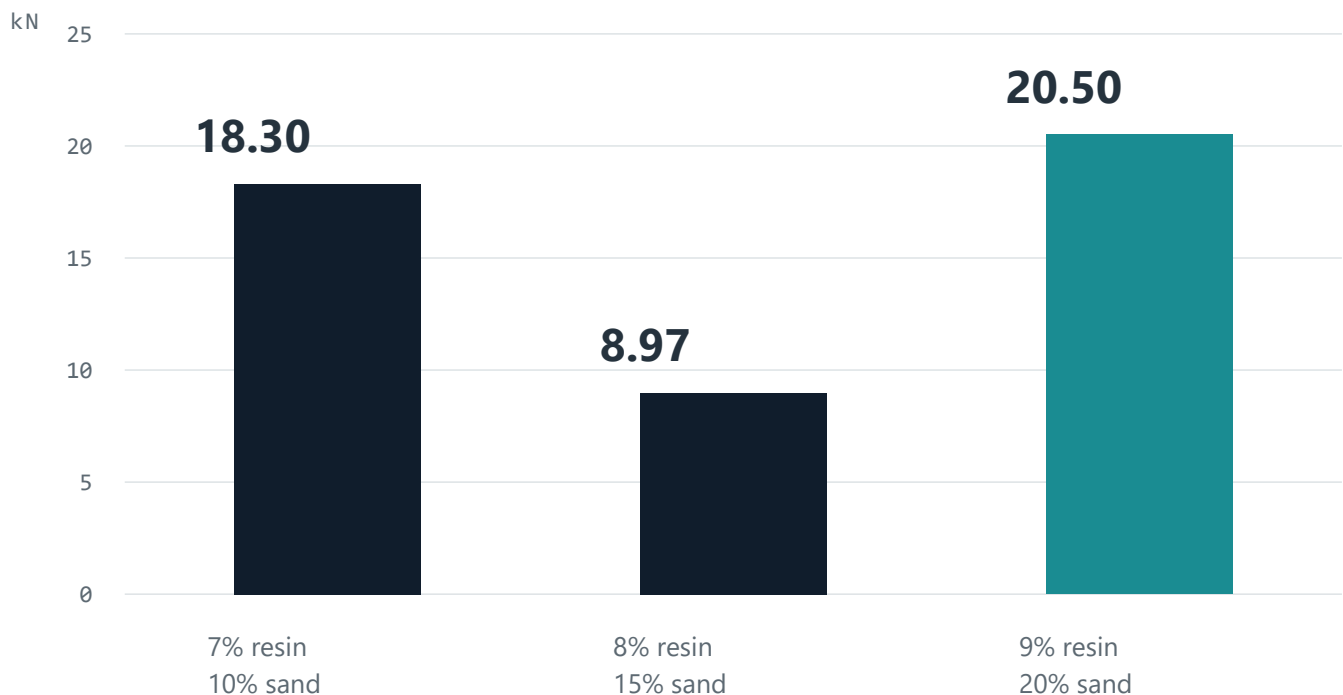
Post-compression specimen. S3 page 32.

02 / SPACE MATERIALS

Results and interpretation

Recorded peak compression load across the three primary formulations

ONE RECORDED TEST PER PRIMARY FORMULATION



Source S3 pages 31 and 42. Percentages follow the original specimen labels.

Observed outcome

Four physical compression records are reported: three primary formulations and one additional mixture. The highest recorded peak load was **20.50 kN**. The additional mixture, labelled 5 g resin and 4 g sand, recorded 18.50 kN.

What the evidence supports

Resin and sand content changed together and the primary formulations were not replicated. This identifies the strongest specimen in this set, without isolating resin effects or establishing an optimum. Lunar service conditions were not qualified.

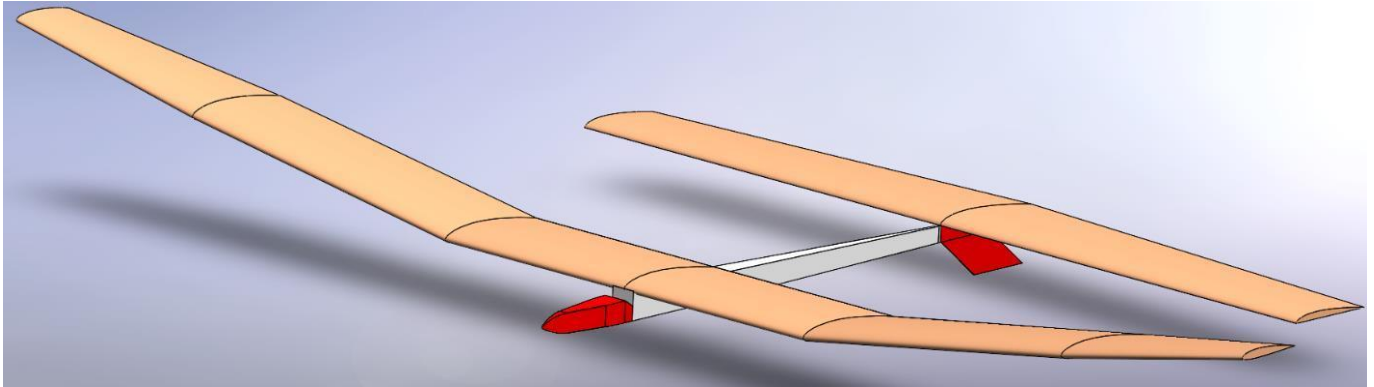
NEXT INVESTIGATION

Repeat each formulation, control composition factors, reconcile the binder recipe, verify specimen geometry and retain raw force-displacement data. A separate environmental test plan is needed before service claims.

03 / AIRCRAFT DESIGN

Glider tail design

AE6110 individual design contribution within a team aircraft project



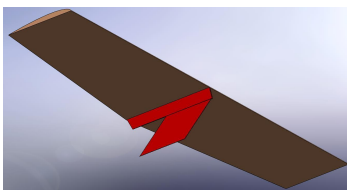
Full glider CAD illustration from S4 page 12.

PERSONAL SCOPE

Empennage

Vertical fin
Horizontal stabiliser
Associated surfaces

SolidWorks
Technical drawings
JavaFoil



Tail CAD. S4 page 12.

Design and integration

The team constructed and flight-tested a 51-inch Keil Kraft Caprice balsa kit. I focused on tail geometry, moment arm, stability, weight, incidence and trim.

- Developed tail models, technical drawings, surface-area measurements and assembly guidance.
- Coordinated with wing design work, supported teammates using SolidWorks, and led tail assembly and alignment.
- Used JavaFoil to examine a NACA 0015 tail aerofoil over a reported angle range of -5 to $+15$ degrees.

OUTCOME AND SCOPE

The report records tail design work and team kit flight testing on 14 January 2025. Further CAD integration remained; measured performance gains and flight testing of the modified CAD configuration are not established.

04 / CAREER DIRECTION

Pathway into systems engineering

Graduate and trainee opportunities in aerospace and space

I bring practical inspection, design and test experience, and want to develop formal systems engineering skills through supervised project work.

CURRENT EVIDENCE

FOUNDATION FOR SYSTEMS WORK

Drawing inspection and FAIR records	Measurable criteria, conformance evidence and traceability.
Spring and lunar materials tests	Test setup, result interpretation and repeatable verification.
Glider tail design and collaboration	Subsystem interfaces, integration and design assumptions.
Fault feedback and calibration records	Anomaly reporting, controlled records and communication.

Tools and development

Project evidence: SolidWorks, technical drawings, JavaFoil, dimensional measurement and compression-test analysis.

Additional tools listed in my CV: CATIA, AutoCAD, Inventor, Python and Microsoft Office.

An AS9102 FAIR generator in Python is in development; a demonstrable release and validation remain to be documented. Development priorities include requirements definition, verification planning, interfaces and systems modelling.

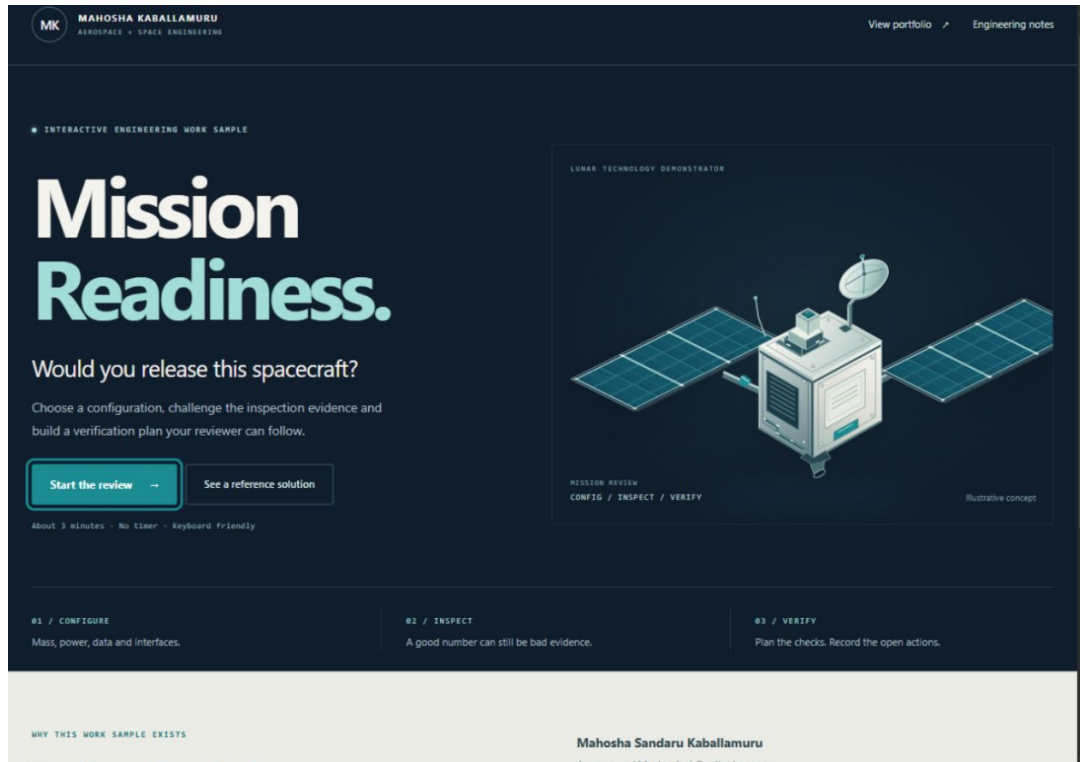
EVIDENCE INDEX

- S1 Recent aerospace CV: career roles, tools and contact details.
- S2 Kingston University certificate: BSc 2:1, awarded 12 June 2025.
- S3 Lunar report: methods pp 13-24; results pp 31-32, 42; limits pp 37-38, 45.
- S4 Glider report: flight test pp 8-9; contribution p 10; CAD p 12; analysis pp 13-15.

PDF page numbers. Original documents and the detailed evidence index are in the companion pack.

Mission Readiness

A browser challenge in spacecraft configuration, inspection and verification planning.



Educational portfolio demonstration with an illustrative spacecraft and fictional engineering data.

Configure / Inspect / Verify

Balance mass, power, data and interfaces. Challenge an expired-gauge record, choose the correct disposition and leave a traceable verification plan. The final record separates planned checks from outstanding hardware evidence.