

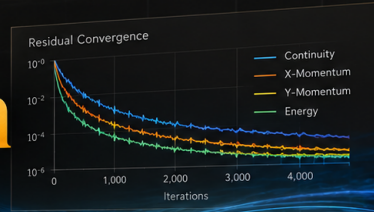
RESEARCH & INTELLIGENCE

CFD Validation That Means Something

Convergence, Continuity,
Mass Flow & Provenance



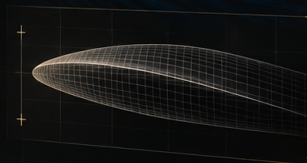
Macaroon Network



VALIDATE
UNDERSTAND
TRUST



Mass Flow Balance	
Inlet	+12.500 kg/s
Outlet	-12.497 kg/s
Imbalance	0.02 %



Geometry	airfoil_v1.step
Mesh	4.2M cells
Solver	steady RANS
Turbulence	k- ω SST
Case ID	cfd_2024_017
Date	2024-08-16
Source	validated

OFFICIAL SAMPLE PREVIEW

44 pages in the full edition - this preview intentionally contains only a small sample.

Use this PDF on the Macaroon Network ebook page or Gumroad listing so buyers can judge the quality without receiving the complete book.

What the full ebook is designed to give you

CFD engineers, consultants, reviewers, students and teams delivering simulation results to clients.

In the full edition you will be able to:

- Separate convergence from physical validation.
- Review residual reduction, continuity and mass-flow imbalance.
- Keep mesh and timestep independence as separate evidence states.
- Preserve solver, configuration, mesh and result provenance.
- Use PASS, FAIL, UNKNOWN and NOT TESTED honestly.

What is included in the full ebook

- ☐ CFD validation versus verification explained
- ☐ Residual and conservation review methods
- ☐ Mesh/timestep independence boundaries
- ☐ Worked review cases
- ☐ Professional evidence and client-delivery templates

The complete edition is 44 pages. This sample does not include the complete exercises, chapter teaching, templates, worked material or final reference sections.

Sample: converged is not the same as validated

A CFD run can be numerically well behaved and still be physically wrong. Residuals may fall, mass balance may look excellent and monitored quantities may stabilize - yet the turbulence model, boundary conditions or mesh may still be inappropriate for the intended claim.

That is why a useful review separates questions. Did the algebraic system converge sufficiently? Is continuity controlled? Is inlet-to-outlet mass balance acceptable? Was mesh sensitivity tested? Was timestep sensitivity tested? Was the solution compared with a benchmark or experiment?

If a run passes the first three questions and the last three were never performed, the correct report is not 'everything passed'. It is PASS for the checks supported by evidence and NOT TESTED for the others.

The full handbook develops this discipline in detail and provides practical evidence tables, worked examples and reproducibility records for professional CFD review.

Preview boundary: this excerpt is intentionally short. The full ebook develops the subject through complete chapters, examples, exercises and reference material.

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