



TECHNICAL DOCUMENTATION RELEASE

Acatian Quickstart

Build, review and hand over a first bioprocess model in one focused session

DOCUMENT BASIS

Product workflows, visible results, review criteria, evidence boundaries and controlled handover.

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Document control

One controlled basis for public product guidance.

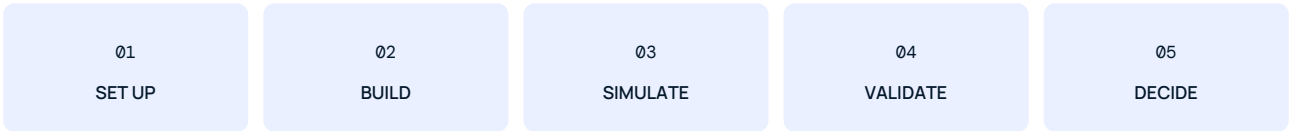
FIELD	VALUE
Document ID	QS-EN-4.2
Release	4.2
Reviewed	6 October 2026
Audience	New Acatian users and technical reviewers
Purpose	A 60-minute guided path from sign-in to a reviewable model package
Owner	Acatian Product and Engineering

APPLICABILITY LIMIT

This manual explains the product workflow and the evidence needed to interpret its outputs. It does not replace qualified engineering judgement, customer quality systems, safety review, equipment-vendor data or validation for a regulated intended use.

Scope and use

Use the navigation path, input register, visible-result description, review criteria and handover record together. A screen or exported number without its model version, basis, unit, evidence status and limitations is not a controlled engineering result.



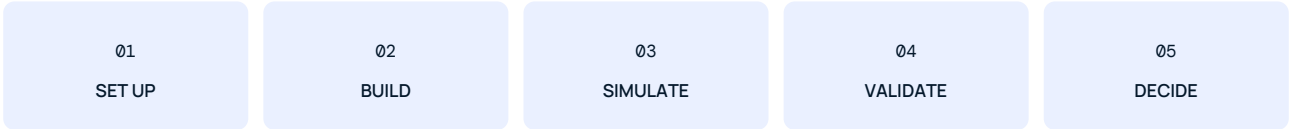
LANGUAGE

This document is written consistently in English. Product navigation names remain as displayed in the interface.

Your first controlled model

TRAINING CASE

Use a synthetic fed-batch process to explore a 50 L development basis and a 20,000 L commercial target. The exercise teaches model structure, evidence and scale assumptions; it does not provide validated scale-up factors or customer-specific results.



TIME	TASK	OUTCOME
00-10 min	Confirm access and model brief	Named decision and system boundary
10-25 min	Build the process graph	Connected equipment and boundary streams
25-40 min	Configure and run	Traceable run and diagnostics
40-50 min	Validate the result	Visible findings and maturity
50-60 min	Compare and export	Reviewable decision package

CHECK	Use a training project, never a customer production record.
CHECK	Keep the 50 L basis and 20,000 L target as separate scenarios.
CHECK	Record every changed assumption with unit, source and reason.
CHECK	Treat every numerical result as screening until reviewed.

01 | Getting started, projects and model brief

This area defines what Acatian is allowed to calculate. A precise model brief prevents technically correct calculations from answering the wrong engineering question.

ENGINEERING DECISION	PATH IN ACATIAN
Which question should the model answer, for which project and with which evidence basis?	Sign in > Set up > Model brief / Projects + versions / Plant overview

Workflow

1. Check account context

Open profile, organisation, role and plan state.

VISIBLE RESULT

Active user and available capabilities match the assignment.

2. Create or open project

Set project name, product, owner and confidentiality.

VISIBLE RESULT

A separate project with a stable ID is active.

3. Write the model brief

Enter product, scale, mode, decision, boundary and data state.

VISIBLE RESULT

The brief describes intended use without contradiction.

4. Classify evidence

Register available files and mark missing evidence explicitly.

VISIBLE RESULT

Every critical input is a source, assumption or open gap.

APPLICABILITY LIMIT

A complete model brief does not prove physical correctness. It defines what later evidence must demonstrate.

02 | Flowsheet, equipment, streams and equations

The flowsheet is the shared calculation and communication graph. Every unit needs meaningful inlets or outlets; external supply and discharge are modelled as explicit boundary streams.

ENGINEERING DECISION	PATH IN ACATIAN
Is the process architecture complete, directed, balance-ready and suitable for the intended study?	Build > Flowsheet studio / Diagram studio / Equipment register / Stream table / Model equations

Workflow

1. Read the hierarchy

Inspect L0-L6 and separate main process, support, utilities, CIP and waste.

VISIBLE RESULT

Every area has one clear technical role.

2. Place equipment

Filter the library, add a unit, tag and classify it.

VISIBLE RESULT

The unit appears on canvas and in the register.

3. Create boundary streams

Add an external inlet or outlet directly to the unit.

VISIBLE RESULT

Material can cross the model boundary.

4. Connect internal streams

Set source, target, ports, direction and stream type.

VISIBLE RESULT

Arrow direction and connection count agree.

APPLICABILITY LIMIT

A connected diagram is not yet a closed model. Components, reactions, states and numerical tolerances require review.

03 | Dynamic simulation, ODE/PDE and operating modes

Acatian couples component balances with time-dependent states. ODEs represent ideal mixed states; PDEs represent spatial gradients as discretised fields. The operating mode and events must match real operation.

ENGINEERING DECISION	PATH IN ACATIAN
How do process states evolve over time and within which operating envelope is the scenario plausible?	Simulate > Dynamic simulation / Advanced modelling

Workflow

1. Select operating mode

Choose batch, fed-batch, perfusion or continuous and verify working volume.

VISIBLE RESULT

Volume and transfer equations visibly change with mode.

2. Configure states and kinetics

Open ODE/PDE variables, parameters, bounds and sources.

VISIBLE RESULT

The state register is complete and dimensionally consistent.

3. Define events

Schedule feed, inoculation, harvest, bleed, samples and transfers.

VISIBLE RESULT

The event line is causal and chronological.

4. Run preflight

Check structure, units, initial values, bounds and numerics.

VISIBLE RESULT

No blocking finding remains.

APPLICABILITY LIMIT

A stable numerical solution is not biological validity. Project calibration and independent validation remain required.

04 | Physical boundaries, standards and model validation

Validation connects intended use, data, equations, numerics, physical boundaries, comparison evidence and approval. Acatian exposes the state but does not replace technical or regulatory approval.

ENGINEERING DECISION	PATH IN ACATIAN
Is the result sufficiently supported for its intended use, and which gaps block the decision?	Validate > Boundaries + AI / Standards / Readiness / Engineering review

Workflow

1. Define validation plan

Document intended use, risk, datasets, metrics and tolerances.

VISIBLE RESULT

The plan is versioned before results are inspected.

2. Verify numerics

Assess closure, solver, convergence, discretisation and reproducibility.

VISIBLE RESULT

Numerical health has no unexplained blocker.

3. Verify physics

Evaluate process, equipment and quality bounds against trajectories.

VISIBLE RESULT

Violations include time, magnitude and action.

4. Compare data

Compare prediction and measurement with residuals, bias and intervals.

VISIBLE RESULT

Pass/fail is traceable for every criterion.

APPLICABILITY LIMIT

Acatian organises evidence and tests; qualified people and approved company processes own regulated, safety and investment approval.

05 | TEA, LCA, uncertainty and sensitivity

TEA and LCA must use the same product quantity, yield, time basis and system boundary. Acatian traces flows, costs, factors, allocation, uncertainty and sensitivity to source.

ENGINEERING DECISION	PATH IN ACATIAN
Which process option is economically and environmentally preferable, under which assumptions and uncertainty?	Decide › Economics / LCA / Sensitivity

Workflow

1. Set goal and scope

Define decision, audience, boundary, FU, allocation and impact method.

VISIBLE RESULT

The study header is complete.

2. Build inventory

Classify boundary streams, utilities, cleaning, transport and waste.

VISIBLE RESULT

LCI contains external exchanges and explicit lifecycle stages.

3. Calculate cost

Calculate variable/fixed OPEX, CAPEX, working capital and output basis.

VISIBLE RESULT

Cost stack and cost/kg close to the same production amount.

4. Calculate impacts

Apply factors to quality-reviewed exchanges.

VISIBLE RESULT

LCIA shows category, unit, stage and contributor.

APPLICABILITY LIMIT

Database factors and price proxies are screening data until region, technology, year and supply chain are reviewed.

06 | Reports, downloads, APIs and engineering handover

A complete handover is more than headline KPIs. Acatian exports long-form tables, visuals, process graph, inputs, equations, uncertainty, readiness, version and manifest together.

ENGINEERING DECISION	PATH IN ACATIAN
Can a third party understand the claim, evidence basis, model version and limitations without hidden knowledge?	Decide > Reports & downloads / API export

Workflow

1. Define recipient

Set engineering, TEA/LCA, QA, supplier or management and their question.

VISIBLE RESULT

The output set matches the user task.

2. Choose package

Select complete package or targeted XLSX/CSV/PDF/SVG/JSON/API artifacts.

VISIBLE RESULT

The list shows content, rows/sheets and version.

3. Generate export

Create the package and write the manifest.

VISIBLE RESULT

Download completes with stable filenames.

4. Open files

Test XLSX in Excel, PDF in viewer, SVG in browser and CSV delimiter.

VISIBLE RESULT

No repair warning, clipping or encoding error.

APPLICABILITY LIMIT

A complete export documents model state; it does not turn a screening result into a validated result.

Final review and handover

CHECK	The 50 L and 20,000 L scenarios have explicit, different scale assumptions.
CHECK	The process graph has no unexplained open port or isolated main-process unit.
CHECK	The run ID, model version, solver state and diagnostics are recorded.
CHECK	Mass closure, units, bounds and evidence gaps are reviewed.
CHECK	The exported package includes inputs, results, limitations and a restore point.

NEXT STEP

Open the focused module manual for any step that needs deeper input definitions, review criteria or troubleshooting.