



GETTING STARTED GUIDE

Acatian Getting Started Guide

A complete, task-based route from first sign-in to a reviewable engineering decision

DOCUMENT BASIS

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



Document control

One controlled basis for public product guidance.

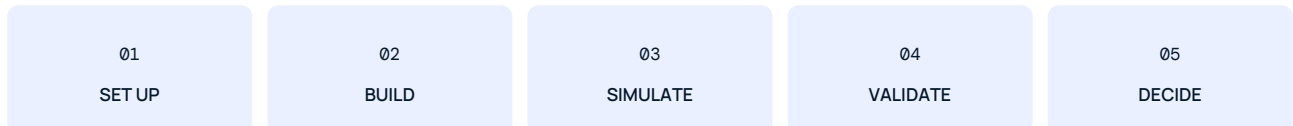
FIELD	VALUE
Document ID	GS-EN-4.2
Release	4.2
Reviewed	6 October 2026
Audience	New users in process development, process engineering, MSAT, scale-up, facility planning, TEA, LCA and technical review
Purpose	Provide one durable reference for the complete Acatian workflow
Owner	Acatian Product and Engineering

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.

Current capability map

The map below is the documentation scope for release 4.2.

NO.	CAPABILITY	WHAT IS COVERED
01	Workspace and access	Account context, organisations, roles, project ownership, subscription entitlement and controlled sign-in.
02	Model brief and governance	Intended use, system boundary, owners, reviewers, data status, maturity and evidence gaps.
03	Flowsheet and equipment	Process hierarchy, equipment register, components, reactions, streams, ports, boundaries and equations.
04	Simulation	Steady-state balances, batch, fed-batch, perfusion and continuous dynamics, ODE/PDE states, events and solver controls.
05	Transport and scale-up	Equipment sizing, mixing, mass transfer, heat transfer and governed bioreactor CFD screening and case setup.
06	Factory operations	Batch scheduling, campaigns, finite equipment, rooms, people, utilities, cleaning, hold times and release constraints.
07	Data and integrations	Files, mappings, APIs, connectors, provenance, review, rollback and a separate customer-site OT gateway boundary.
08	Validation	Structural, numerical, physical and evidence checks, acceptance criteria, standards mapping and readiness gates.
09	Decision analysis	TEA, LCA, uncertainty, sensitivity, scenario comparison and transparent decision constraints.
10	Collaboration and outputs	Branches, versions, review, approval, restore, reports, SVG, CSV, JSON, spreadsheet and package exports.

PRODUCT BOUNDARY

Acatian connects model structure, calculation, evidence and decision outputs. It does not turn missing industrial evidence into certainty and it does not connect the public cloud service directly to PLC or safety systems.

How to use this guide

ONE RULE

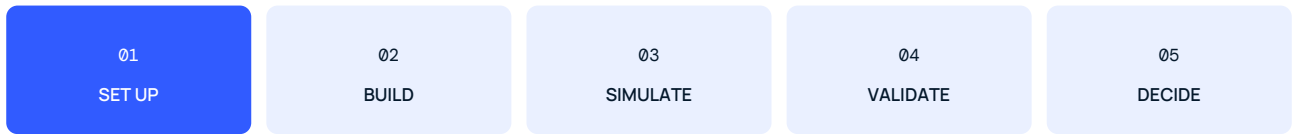
A value is an engineering result only after the current model has been calculated. Planned or changed models show Not calculated or Recalculate instead of provisional numbers.

STAGE	QUESTION	EXIT EVIDENCE
01 Set up	What decision and boundary does the model support?	Controlled brief, owners and baseline
02 Build	Is the process graph complete and balanceable?	Connected equipment, streams and equations
03 Simulate	What happens over time and at scale?	Run ID, solver state and diagnostics
04 Validate	Which results are supported by evidence?	Checks, gaps, standards and review state
05 Decide	Which option best meets the engineering objective?	Compared scenarios and decision package

CHECK	Use a separate project for every customer or technical decision.
CHECK	Keep measured, sourced, assumed, calculated and missing values visibly distinct.
CHECK	Save a baseline before changing process structure, scale, data or equations.
CHECK	Never interpret cost, output, utilities or utilization before a successful run.
CHECK	Export the model basis and limitations together with every result.

Getting started, projects and model brief

From personal account to a clearly bounded engineering assignment



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

START WITH THE DECISION

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

Prepare the model

INPUT	READY WHEN
Product and process family	Product, organism/cell line and route are unambiguous.
Intended use	One question states target, scale and horizon.
System boundary	Inlets, outlets, utilities, waste and exclusions are named.
Owner and reviewer	A person or function is assigned to each role.
Data inventory	Unit, period, provenance and confidentiality are recorded.

01 | Workflow

01 Check account context

Open profile, organisation, role and plan state.

VISIBLE RESULT

Active user and available capabilities match the assignment.

02 Create or open project

Set project name, product, owner and confidentiality.

VISIBLE RESULT

A separate project with a stable ID is active.

03 Write the model brief

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

VISIBLE RESULT

The brief describes intended use without contradiction.

04 Classify evidence

Register available files and mark missing evidence explicitly.

VISIBLE RESULT

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

05 Protect the baseline

Save the baseline and create a branch for changes.

VISIBLE RESULT

A restorable start point with a change note exists.

01 | Review the result

CRITERION	PASS CONDITION	IF IT FAILS
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APPLICABILITY LIMIT

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

Troubleshooting

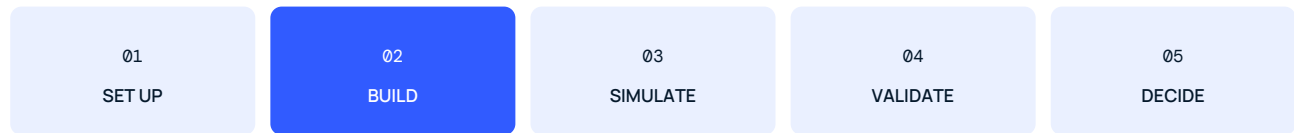
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The module appears complete but readiness is low	Required industrial evidence is still missing.	Assign the visible gaps and keep maturity at Screening or Not decision-ready.

Controlled handover

ARTIFACT	RECIPIENT	MUST CONTAIN
Module result package	Engineering reviewer	Inputs, calculations, results, units, intervals, maturity
Readiness register	Model owner	Gap, required work, owner, due date, intended use
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Flowsheet, equipment, streams and equations

Build, connect and technically inspect a complete process graph



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

START WITH THE DECISION

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.

Prepare the model

INPUT	READY WHEN
Unit-operation list	Every operation has a tag, function and stage.
Component list	Names, formulas, phase and base unit are unique.
Stream basis	Source/target, units, temperature, pressure and time basis exist.
Equipment basis	Nominal/working volume and sizing rule are documented.

02 | Workflow

01 Read the hierarchy

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

VISIBLE RESULT

Every area has one clear technical role.

02 Place equipment

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

VISIBLE RESULT

The unit appears on canvas and in the register.

03 Create boundary streams

Add an external inlet or outlet directly to the unit.

VISIBLE RESULT

Material can cross the model boundary.

04 Connect internal streams

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

VISIBLE RESULT

Arrow direction and connection count agree.

05 Inspect equations

Open reactions, separations, accumulation, energy and economics.

VISIBLE RESULT

Every calculated quantity has equation and unit.

06 Audit the graph

Check isolated units, open ports, cycles and unexplained bypasses.

VISIBLE RESULT

No unexplained main-process island remains.

02 | Review the result

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APPLICABILITY LIMIT

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

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Dynamic simulation, ODE/PDE and operating modes

Calculate batch, fed-batch, perfusion and continuous processes reproducibly



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

START WITH THE DECISION

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.

Prepare the model

INPUT	READY WHEN
Initial states	Every state has value, unit and source.
Kinetics	Equation, parameter range and applicability are documented.
Operating profile	Events, rates and control logic are defined.
Numerics	Solver, step size, tolerance and stop conditions are set.
Measured data	Training and validation datasets are separated.

03 | Workflow

01 Select operating mode

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

VISIBLE RESULT

Volume and transfer equations visibly change with mode.

02 Configure states and kinetics

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

VISIBLE RESULT

The state register is complete and dimensionally consistent.

03 Define events

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

VISIBLE RESULT

The event line is causal and chronological.

04 Run preflight

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

VISIBLE RESULT

No blocking finding remains.

05 Start simulation

Start the run and observe convergence, step size and residuals.

VISIBLE RESULT

Run ID, solver state and complete trajectory are produced.

06 Compare scenarios

Change only intended parameters and compare to branch baseline.

VISIBLE RESULT

Before/after exposes states, outputs and boundary violations.

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APPLICABILITY LIMIT

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

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Bioreactor CFD and transport analysis

Set up geometry, boundary conditions, transport physics and validation under control



ENGINEERING DECISION	PATH IN ACATIAN
Where do mixing, oxygen, nutrient, shear or heat-transfer risks arise inside the reactor?	Simulate > Bioreactor CFD

START WITH THE DECISION

The CFD area leads from real reactor geometry and boundary conditions to a transport-physics assessment. It calculates only after an explicit start and separates screening from a qualified external 3D run.

Prepare the model

INPUT	READY WHEN
Geometry	Dimensions, coordinates and CAD/sketch source are reviewed.
Rheology and phases	Density, viscosity, model and temperature basis exist.
gas_inlet	alpha.gas, U.gas, C_O2 and sparger basis are set.
feed_inlet	C_N/glucose/glutamine, rate, port and profile are set.
walls_baffles	U.liquid = noSlip and wall treatment are documented.
top_headspace	p_rgh/alpha.gas and foam/headspace basis are set.
impeller_zone	Axis, rpm, direction, diameter and zone are reviewed.
cell_uptake	S_O2/S_N, biomass field and time basis are defined.

04 | Workflow

01 Select reactor

Open the equipment tag and reconcile nominal and working volume.

VISIBLE RESULT

The CFD case is linked to one model version.

02 Build geometry

Parameterise tank, baffles, impellers, sparger, feed and headspace.

VISIBLE RESULT

The section matches real hardware.

03 Choose physics

Select turbulence, multiphase, species, heat and reaction models.

VISIBLE RESULT

Active equations and assumptions are visible.

04 Assign boundaries

Configure gas, feed, walls, headspace, impeller and uptake zones.

VISIBLE RESULT

Every boundary has a field, unit and physical meaning.

05 Start deliberately

Confirm preflight and only then press Start.

VISIBLE RESULT

Run ID, time progress, residuals and field time appear.

06 Interpret fields

Review velocity, holdup, DO, nutrient, shear, mixing and hotspots over time.

VISIBLE RESULT

Risk zones are spatially and quantitatively documented.

07 Validate externally

Export a 3D case and compare with PIV, tracer, kLa, DO or mixing data.

VISIBLE RESULT

Solver and experimental evidence are linked to the version.

04 | Review the result

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APPLICABILITY LIMIT

The browser view is a screening and setup tool. Valid 3D claims require a real solver, mesh study, verification and experimental validation.

Troubleshooting

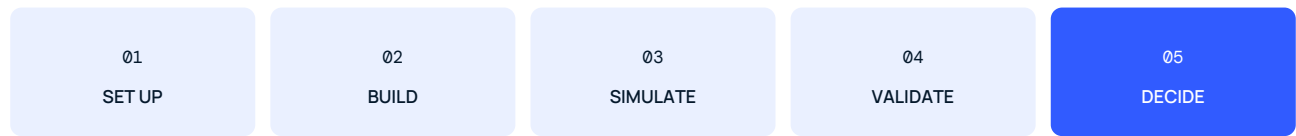
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Scheduling, resources and factory twin

Plan batches, cleaning, rooms, personnel and shared equipment at finite capacity



ENGINEERING DECISION	PATH IN ACATIAN
What production is achievable with the real resources, cleaning and release times?	Decide > Factory twin / Scheduling

START WITH THE DECISION

Scheduling converts the process graph into resource occupancy. Equipment can be reused only when transfer, cleaning, setup, maintenance, rooms, personnel and utilities are conflict-free.

Prepare the model

INPUT	READY WHEN
Operation durations	Min/typ/max or a distribution exists per operation.
Equipment pools	Capacity, calendar and changeover rules are set.
CIP/SIP	Recipe, duration, dirty/clean hold and release are modelled.
Rooms and personnel	Shift calendar, qualification and room state exist.
Utilities	Capacity profiles and peak limits are set.
Release and holds	Sampling, test duration, hold limit and batch state are defined.

05 | Workflow

01 Create operations

Translate flowsheet units into tasks with duration, precedence and batch.

VISIBLE RESULT

Each relevant unit has an executable task.

02 Assign resources

Attach equipment, room, personnel, utility and QC as finite resources.

VISIBLE RESULT

Each task shows all simultaneous requirements.

03 Model reuse and cleaning

Insert transfer, CIP/SIP, setup and release after production.

VISIBLE RESULT

The equipment state machine moves through dirty, cleaning, ready and running.

04 Plan campaigns

Schedule starts, parallel trains, product switches and maintenance.

VISIBLE RESULT

Gantt and WIP show a conflict-free sequence.

05 Optimise

Choose throughput, tardiness, WIP or cost and lock constraints.

VISIBLE RESULT

The plan improves the objective without hard violations.

06 Test robustness

Simulate duration, failure and release scenarios.

VISIBLE RESULT

Buffers, bottleneck and service level remain visible.

05 | Review the result

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APPLICABILITY LIMIT

A schedule is only as reliable as duration distributions, calendars, cleaning, release and failure data.

Troubleshooting

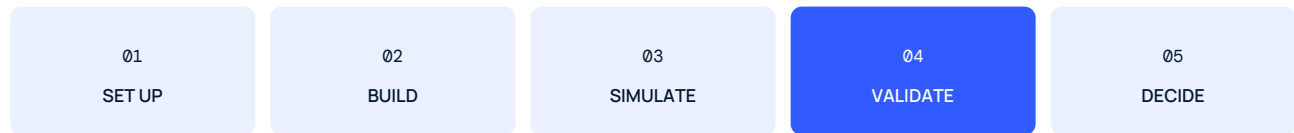
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Data ingestion, sources and API integrations

Capture, map, review and apply company data under control



ENGINEERING DECISION	PATH IN ACATIAN
Which external data may replace which model assumption, and how does every change remain traceable?	Validate > Data & sources / API connectors

START WITH THE DECISION

Acatian converts CSV, TSV, JSON and registered connectors into a governed data inventory. Accepted changes retain source, unit, timestamp, reviewer, mapping and rollback version.

Prepare the model

INPUT	READY WHEN
Files and endpoints	Owner, period, format and usage right are confirmed.
Schema and tag map	Tag, unit, type, frequency and target are defined.
Quality rules	Acceptance limits and error handling are set.
Provenance	Source, import time, hash, reviewer and transformations are stored.
Permissions	Least privilege, organisation and project boundary are reviewed.

06 I Workflow

01 Register data

Upload files in bulk or add a connector and classify the data type.

VISIBLE RESULT

Registry shows owner, type, period and state.

02 Detect schema

Detect columns, types, time axis, units and IDs.

VISIBLE RESULT

A mapping proposal is visible but not applied.

03 Inspect quality

Review completeness, plausibility, duplicates, outliers and coverage.

VISIBLE RESULT

A quality score and actionable error list are produced.

04 Map fields

Map only reviewed fields to parameters, states, streams, schedule or LCA.

VISIBLE RESULT

Every mapping shows source, transformation and target.

05 Review change plan

Read before/after, affected modules and recalculation order.

VISIBLE RESULT

No hidden or unitless change remains.

06 Apply and recalculate

Apply accepted values transactionally and refresh affected views.

VISIBLE RESULT

Version, audit entry and new results are visible.

07 Test rollback

Restore the previous version in a separate test.

VISIBLE RESULT

The original state is reproducible.

06 I Review the result

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APPLICABILITY LIMIT

A successful connection or clean dataset does not prove model accuracy. Technical review and validation remain required.

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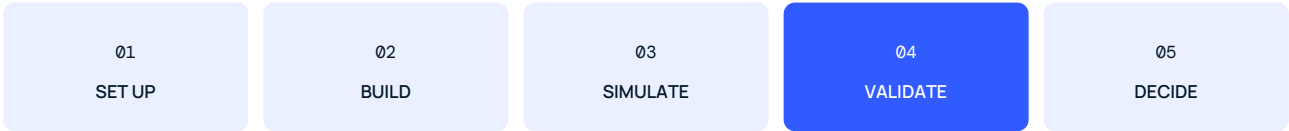
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Physical boundaries, standards and model validation

Turn a calculated result into a traceable engineering statement



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

START WITH THE DECISION

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.

Prepare the model

INPUT	READY WHEN
Intended use	Decision, population, scale and risk are explicit.
Physical boundaries	Boundary, unit, source, action and range are documented.
Validation dataset	An independent dataset and comparison plan exist.
Standards and requirements	Applicability, version, owner and evidence are recorded.
Approval roles	Author, reviewer and approver are separated.

07 | Workflow

01 Define validation plan

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

VISIBLE RESULT

The plan is versioned before results are inspected.

02 Verify numerics

Assess closure, solver, convergence, discretisation and reproducibility.

VISIBLE RESULT

Numerical health has no unexplained blocker.

03 Verify physics

Evaluate process, equipment and quality bounds against trajectories.

VISIBLE RESULT

Violations include time, magnitude and action.

04 Compare data

Compare prediction and measurement with residuals, bias and intervals.

VISIBLE RESULT

Pass/fail is traceable for every criterion.

05 Map standards

Map applicable requirements to model, data, operation and documents.

VISIBLE RESULT

The matrix shows evidence or gap.

06 Set maturity

Select Screening, Calibrated, Validated or Not decision-ready by evidence gates.

VISIBLE RESULT

State, rationale, reviewer and date are stored.

07 Approve or reject

Close findings and sign a controlled version.

VISIBLE RESULT

Audit trail and residual uncertainty are complete.

07 | Review the result

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APPLICABILITY LIMIT

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

Troubleshooting

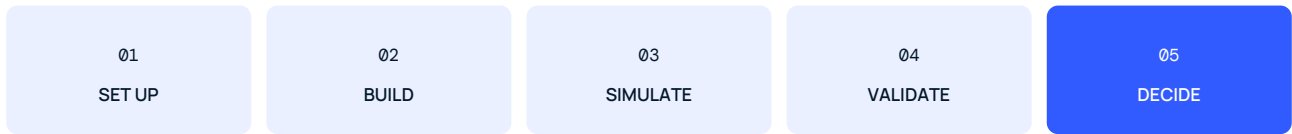
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TEA, LCA, uncertainty and sensitivity

Derive cost and environmental impact from one controlled process basis



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

START WITH THE DECISION

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.

Prepare the model

INPUT	READY WHEN
Functional unit	Product, quality, quantity, location and period are defined.
LCI and material flows	Flow, unit, stage, geography and source exist.
Cost basis	Price date, currency, region, range and source are documented.
Equipment and CAPEX	Quote/correlation, index, basis and life are set.
Allocation and cut-off	Method, rationale and sensitivity are documented.
Uncertainty	Min/mode/max or distribution and correlations are set.

08 | Workflow

01 Set goal and scope

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

VISIBLE RESULT

The study header is complete.

02 Build inventory

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

VISIBLE RESULT

LCI contains external exchanges and explicit lifecycle stages.

03 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.

04 Calculate impacts

Apply factors to quality-reviewed exchanges.

VISIBLE RESULT

LCIA shows category, unit, stage and contributor.

05 Run uncertainty

Run Monte Carlo with documented distributions and seeds.

VISIBLE RESULT

Median, P5/P95 and stability are visible.

06 Assess sensitivity

Compare key drivers and scenarios.

VISIBLE RESULT

Driver ranking explains the decision and actions.

07 Interpret and export

Document hotspots, trade-offs, limitations and gaps.

VISIBLE RESULT

The complete package is reviewable and opens correctly.

08 | Review the result

CRITERION	PASS CONDITION	IF IT FAILS
Scope and structure	The documented criterion is satisfied and supported by traceable evidence.	Correct the model or keep the output Not decision-ready.
Units and balances	The documented criterion is satisfied and supported by traceable evidence.	Correct the model or keep the output Not decision-ready.
Evidence and uncertainty	The documented criterion is satisfied and supported by traceable evidence.	Correct the model or keep the output Not decision-ready.
Reproducibility	The documented criterion is satisfied and supported by traceable evidence.	Correct the model or keep the output Not decision-ready.
Review state	The documented criterion is satisfied and supported by traceable evidence.	Correct the model or keep the output Not decision-ready.

APPLICABILITY LIMIT

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

Troubleshooting

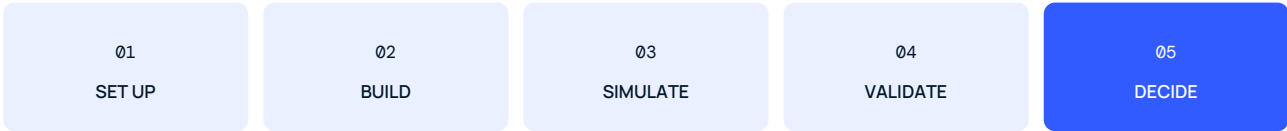
OBSERVATION	LIKELY CAUSE	CORRECTION
The result looks plausible but cannot be explained	Inputs, units, model version or evidence are missing.	Open the relevant register, restore traceability and rerun.
A change affects unexpected outputs	Dependencies or imported mappings were not reviewed.	Inspect the change plan and before/after diff; undo if required.
The module appears complete but readiness is low	Required industrial evidence is still missing.	Assign the visible gaps and keep maturity at Screening or Not decision-ready.

Controlled handover

ARTIFACT	RECIPIENT	MUST CONTAIN
Module result package	Engineering reviewer	Inputs, calculations, results, units, intervals, maturity
Readiness register	Model owner	Gap, required work, owner, due date, intended use
Controlled version	Project team	Branch, version, change note, reviewer and restore point

Versions, branches, collaboration and approval

Develop, compare, review and restore alternatives traceably



ENGINEERING DECISION	PATH IN ACATIAN
Which change was approved by whom, why and with which technical impact?	Projects + versions > Branches / Versions / Collaborators / Review

START WITH THE DECISION

Acatian uses a Git-like model history. Baselines remain protected, alternatives live in branches, diffs expose structural and KPI impact, and approvals capture author, reviewer and residual uncertainty.

Prepare the model

INPUT	READY WHEN
Baseline	Version, scope, maturity and approval are fixed.
Change request	Owner, affected modules and acceptance criteria are defined.
Branch	Name, base version, owner and purpose are unique.
Review roles	Author, reviewer and approver are separated.
Diff basis	Parameters, units, streams, equations, KPIs and evidence are included.

09 | Workflow

01 Create branch

Create a named alternative from the approved baseline.

VISIBLE RESULT

Branch shows base commit, owner and purpose.

02 Make the change

Edit only the change scope and version intermediate work.

VISIBLE RESULT

Audit trail lists structured operations.

03 Inspect before/after

Compare flowsheet, parameters, data, equations, schedule and results.

VISIBLE RESULT

The diff explains change and impact.

04 Request review

Invite a reviewer with context, criteria and open findings.

VISIBLE RESULT

Review state and comments are linked to the model.

05 Close findings

Document correction, rationale or accepted residual risk.

VISIBLE RESULT

No blocking finding remains unanswered.

06 Merge and approve

Merge the reviewed branch and create a controlled version.

VISIBLE RESULT

Approval includes author, reviewer, date, maturity and restore point.

07 Test restore

Open the previous version in a test context.

VISIBLE RESULT

Model and artifacts are reproducible.

09 | Review the result

CRITERION	PASS CONDITION	IF IT FAILS
Scope and structure	The documented criterion is satisfied and supported by traceable evidence.	Correct the model or keep the output Not decision-ready.
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Evidence and uncertainty	The documented criterion is satisfied and supported by traceable evidence.	Correct the model or keep the output Not decision-ready.
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Review state	The documented criterion is satisfied and supported by traceable evidence.	Correct the model or keep the output Not decision-ready.

APPLICABILITY LIMIT

Versioning makes changes traceable, not automatically correct. Merge does not replace validation or QMS signatures.

Troubleshooting

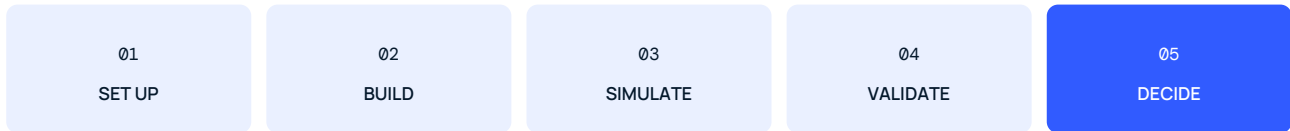
OBSERVATION	LIKELY CAUSE	CORRECTION
The result looks plausible but cannot be explained	Inputs, units, model version or evidence are missing.	Open the relevant register, restore traceability and rerun.
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Controlled handover

ARTIFACT	RECIPIENT	MUST CONTAIN
Module result package	Engineering reviewer	Inputs, calculations, results, units, intervals, maturity
Readiness register	Model owner	Gap, required work, owner, due date, intended use
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Reports, downloads, APIs and engineering handover

Hand over complete, readable and reproducible engineering results



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

START WITH THE DECISION

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

Prepare the model

INPUT	READY WHEN
Controlled version	Project, branch, version, run ID and maturity are known.
Output scope	Review question and formats are selected.
Units and metadata	Unit, basis, interval, source and time context are included.
Confidentiality	Classification, recipient and redaction are reviewed.
Integrity	Manifest, checksums and model snapshot exist.

10 | Workflow

01 Define recipient

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

VISIBLE RESULT

The output set matches the user task.

02 Choose package

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

VISIBLE RESULT

The list shows content, rows/sheets and version.

03 Generate export

Create the package and write the manifest.

VISIBLE RESULT

Download completes with stable filenames.

04 Open files

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

VISIBLE RESULT

No repair warning, clipping or encoding error.

05 Inspect content

Verify cover, dictionary, units, inputs, long-form results, gaps and version.

VISIBLE RESULT

A third party can reproduce the claim.

06 Hand over and archive

Record package, approval, recipient and retention.

VISIBLE RESULT

Handover record and restore point exist.

07 Automate API

Use JSON/REST/webhook with minimal scopes and schema version.

VISIBLE RESULT

The consumer validates schema and idempotency.

10 | Review the result

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Units and balances	The documented criterion is satisfied and supported by traceable evidence.	Correct the model or keep the output Not decision-ready.
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Review state	The documented criterion is satisfied and supported by traceable evidence.	Correct the model or keep the output Not decision-ready.

APPLICABILITY LIMIT

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

Troubleshooting

OBSERVATION	LIKELY CAUSE	CORRECTION
The result looks plausible but cannot be explained	Inputs, units, model version or evidence are missing.	Open the relevant register, restore traceability and rerun.
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ARTIFACT	RECIPIENT	MUST CONTAIN
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Worked scale-up route: 50 L to 20,000 L

TRAINING BOUNDARY

Use synthetic data and separate scenarios. This route teaches traceability and comparison; it is not a validated scale-up correlation or a customer result.

STEP	50 L DEVELOPMENT BASIS	20,000 L TARGET
Model brief	Characterize process and evidence	Name the scale decision and acceptance criteria
Geometry	Record vessel, impeller, probes and working volume	Create a separate equipment basis; do not multiply dimensions
Transport	Establish mixing, kLa, heat and shear evidence	Choose governed similarity criteria and limits
Process	Calibrate kinetics and yields to development data	Carry parameters with explicit uncertainty and change notes
Facility	Define recipe, resources and release logic	Test finite equipment, utilities, cleaning and campaigns
Decision	Save the reviewed baseline	Compare output, quality proxies, cost, impact and evidence gaps

Scale-up acceptance checklist

CHECK	The 50 L and 20,000 L cases are separate versions or scenarios with independent geometry.
CHECK	Every transferred parameter has a physical rationale, source, unit and uncertainty.
CHECK	Mass, energy and component closures pass for both cases.
CHECK	Mixing, oxygen transfer, heat removal, shear, foaming and control ranges are reviewed.
CHECK	The campaign schedule uses finite equipment, cleaning, hold-time and release constraints.
CHECK	TEA and LCA use the same functional unit, allocation rule, time basis and scenario version.
CHECK	Sensitivity and uncertainty identify which evidence could change the decision.
CHECK	The final package includes assumptions, diagnostics, findings, approvals and applicability limits.

STOP CONDITION

Do not promote the target case to decision-ready while a critical physical, numerical, evidence or validation gap remains open.

Final handover

ARTIFACT	RECIPIENT	MUST CONTAIN
Model package	Engineering reviewer	Project, branch, version, model brief, inputs, equations, run IDs and restore point
Decision package	Decision owner	Compared scenarios, acceptance criteria, results, uncertainty, sensitivity and recommendation
Evidence register	Quality and validation	Source, owner, unit, timestamp, review state, applicability and open gaps
LCA bridge	Sustainability/LCA	Functional unit, foreground inventory, databases, methods, allocation, uncertainty and Brightway-compatible export

CHECK	A reviewer can reproduce the active result from the saved package.
CHECK	No result is separated from its model basis, unit, evidence status or limitation.
CHECK	The next decision, owner and remaining evidence work are explicit.

ACCESS
<https://acatian.com/login> | support@acatian.com

Working glossary

TERM	MEANING
Baseline	A controlled model state used as the reference for comparison or restore.
Boundary stream	An explicit material or energy path entering or leaving the modelled system.
Evidence status	The declared state of a value: measured, sourced, assumed, calculated or still missing.
Intended use	The named engineering question, user, scale, time horizon and decision that the model supports.
Maturity	The evidence-based state of a model or result, not a score based on visual completeness.
Run ID	The stable identifier that links settings, model version, results and diagnostics for one calculation.
Screening	A directional engineering result that still requires project-specific calibration or validation.
Validation	Documented evidence that a model is suitable for its stated intended use within an approved range.