

The right material, the right amount, recorded once.

For production, quality and engineering teams choosing software for formula control, scan-checked dispensing, scale readings against tolerance and the batch record that follows.



From formula to weighing

Versions, scaling, targets and tolerances that reach the station.

One premix, worked through

WO-4410: scans, readings, an exception and the review.

Questions that expose gaps

Stations, scales, micro quantities, RFP questions and a scored checklist.

CONTENTS

What's inside

1	Why weighing records fail	3
2	Formulas and recipes: the version in force	4
3	Formula structure: lines, percentages and controlled change	5
4	Scaling, targets and tolerances	6
5	Tare, gross, net, units and staged weighing	7
6	At the scan: right material, usable lot	8
7	Material status and the rules behind selection	9
8	At the scale: readings against tolerance	10
9	Small quantities and micro ingredients	11
10	Stations, scales and set-up	12
11	One person, two people and electronic signatures	13
12	Corrections, re-weighs and exceptions	14
13	The electronic dispensing record: what it must hold	15
14	Issue, consume, return and yield	16
15	A premix worked through: WO-4410	17
16	The same workflow in different words	18
17	Master data, migration and validation	19
18	Implementation, roles and evidence	20
19	RFP questions and scored checklist	21
20	Where V5 fits, plans and sources	22

Who this is for

Production and operations managers, formulators and technical teams, quality and QA, engineering and IT, in food, ingredients, supplements, cosmetics, chemicals, pharmaceuticals and other batch manufacturing.

Important. This guide explains weighing and formulation workflows for software evaluation. It is not legal or metrology advice. Your procedures set tolerances, exception rules and who signs; suitable scales and their calibration remain your choice and responsibility. People make quality decisions.

1 • THE PROBLEM

Why weighing records fail

The weighing usually happened. What fails is proving the right lot, the right amount and the right version, without rewriting it later.

SYMPTOM	TYPICAL CAUSE	WHAT GOOD LOOKS LIKE
Weights copied from scale to paper to ERP	Three transcriptions, three chances to err	Reading captured once at the station
Wrong bag of a look-alike material	Visual check only	Container scanned and checked against the step
Expired or held lot used	Status checked at release, not at use	Lot status and expiry checked at the scan
Out-of-tolerance charge accepted	Tolerance not visible at the scale	Target and band shown; exception recorded with who and why
Old formula used on the floor	Printed copies outlive revisions	Work orders take the version in force
Micro ingredient totals don't add up	Portions not recorded separately	Each portion recorded; total is the sum
Review takes days	Reviewer reads every line	Review starts from exceptions

The outcome to buy. For any batch, show which lots went in, how much, against which formula version, and who handled each exception.

Avoid buying a scale driver. Reading a scale is the easy part. Ask how the reading becomes a reviewed record.

Formulas and recipes: the version in force

Production should work from one approved version. Changes are drafted alongside, approved and made effective on a date.

ELEMENT	WHAT TO HOLD	WHY IT MATTERS
Version and status	Draft / approved / effective / superseded	Only the version in force reaches work orders
Effective date	When the new version applies	Open orders and new orders behave predictably
Approval history	Who approved, when, with reason for change	Shows the change was controlled
Ingredients per unit	Quantity per unit of output, with units	Allows scaling to any batch size
Tolerance per line	Band carried with the version	The scale shows the band for that version
Steps and checks	Order of addition, in-process checks	The floor follows the method, not memory
Label and pack details	Linked to the recipe where applicable	Pack-out matches what was made

What to see demonstrated

- Compare two versions side by side and see what changed.
- Approve a new version, set an effective date, and show which work orders use which version.
- Show what happens to an order already released on the old version.

3 · FORMULA STRUCTURE

Formula structure: lines, percentages and controlled change

A formula is more than a list. How it is structured decides whether scaling, costing, labels and change control work later.

Per unit Quantity per kg, litre or unit of output. Scales to any batch size with simple multiplication.	Percentage Share of the batch by weight. Easy for formulators; the system must convert to a quantity for the scale.	Sub-formulas A premix or base made separately, then used as one line in the parent formula with its own lot.
---	---	--

STRUCTURE QUESTION	WHY IT MATTERS	ASK TO SEE
Lines and units	kg, g and mg mixed in one formula invite slips	How units are stored and displayed per line
Percentages that sum	Rounding can leave 99.98%	What the system does when a version does not sum to 100%
Sub-formulas and premixes	The premix lot must appear in the parent's genealogy	A parent batch tracing back through the premix lot
Alternates	An approved substitute is a controlled choice, not a free swap	Where alternates are defined and who approved them
Losses and finished weight	Moisture or process loss changes yield and label values	Where expected loss is held and how it is used

Controlled change, in five moves



People approve formulas. Software can show what changed and record who approved it. Whether one or two signatures are needed is your procedure; ask which plan supports two-signature approval.

4 • TARGETS

Scaling, targets and tolerances

A target is the formula quantity scaled to the batch. A tolerance is the band your procedure accepts. Both should reach the scale without retyping.

LINE (PREMIX SP-9, PER KG)	PER UNIT	BATCH 250 KG TARGET	TOLERANCE (EXAMPLE)
Salt RM-12	0.180 kg	45.00 kg	± 0.5%
Dextrose RM-40	0.300 kg	75.00 kg	± 0.5%
Spice blend RM-77	0.512 kg	128.00 kg	± 0.5%
Colour CL-7	0.0014 kg	0.350 kg (350 g)	± 1.0 g
Flavour FL-2	0.0066 kg	1.650 kg	± 5 g

Set tolerance from the process. Derive it from product and process need and the scale's capability, not from habit. Small lines often need absolute bands, not percentages.

Check the scale fits the band. A scale whose resolution is close to the tolerance cannot prove the charge. Your procedure decides the minimum ratio.

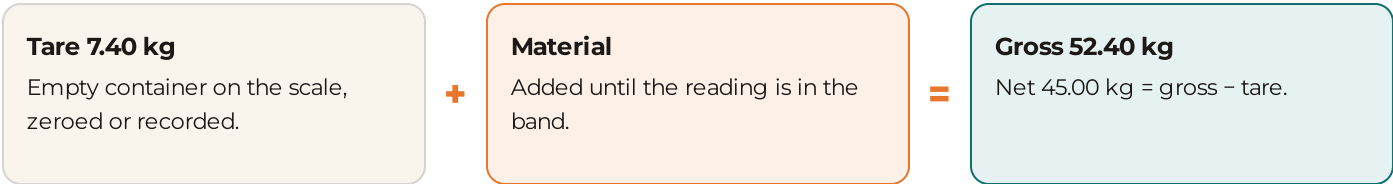
Questions for the demo

- Where is the tolerance stored, and does it change with the formula version?
- How are percentage and absolute bands handled on very small lines?
- How is rounding shown to the operator and on the record?

5 · WEIGHING BASICS

Tare, gross, net, units and staged weighing

Most weighing disputes come down to four things: what the container weighed, what was recorded, which unit, and how many decimals.



TOPIC	GOOD PRACTICE	WHAT TO CHECK IN A SYSTEM
Tare	Recorded, not just zeroed and forgotten	Is tare kept with the net where your set-up captures it?
Units	One unit per line, conversions defined once	Is the unit on the record the unit the scale reported?
Decimals and rounding	Display matches scale resolution	How rounding is shown to the operator and on the record
Staged weighing	Large charges split across containers or lifts	Is each stage a separate entry that adds to the total?
Partial containers	Remaining quantity returned to stock with its lot	How the remainder and its label are handled

Staged example. 128.00 kg spice blend weighed as 50.00 + 50.00 + 28.40 kg in three bags. The record keeps three lines and a 128.40 kg total.

Resolution matters. A scale reading to 0.02 kg cannot prove a ± 0.01 kg band. The minimum ratio is your procedure's decision.

6 · MATERIAL CHECKS

At the scan: right material, usable lot

The cheapest place to stop a wrong material is before it is opened. Check identity and lot status at the scan, not only at release.

CHECK AT THE SCAN	EXAMPLE	WHAT HAPPENS IF IT FAILS
Material matches the step	RM-77 scanned for RM-77	Look-alike RM-78 flagged; operator does not proceed under normal rules
Lot status	Approved, not on hold or quarantine	Held lot flagged at the scan
Expiry or retest date	Within date on the day of use	Expired lot flagged
Quantity available	Enough on this container	Split across containers, each recorded
Permitted exception	Procedure allows an alternative lot	Recorded with operator, reason and signature for quality review

Record the container, not just the material. One record per container keeps lot genealogy exact when a charge comes from two bags.

Ask precisely. "Prevents" means different things. Ask what the operator sees, what they can do next, and who reviews it, on your set-up.

7 • SELECTION RULES

Material status and the rules behind selection

A scan check is only as good as the rule behind it. People decide the rules; the system applies them consistently and records exceptions.

STATUS OR RULE	SET BY	TYPICAL EFFECT AT THE SCAN (AS YOU CONFIGURE IT)
Quarantine / on hold	Quality	Lot flagged; not used under normal rules
Approved / released	Quality	Lot can be selected
Expiry or retest date	Supplier data and quality	Expired lot flagged on the day of use
Pick order (e.g. first-expiry-first-out)	Warehouse and quality	Suggested lot shown; other choices recorded
Permitted exception	Quality, in the procedure	Allowed with reason and signature, then reviewed
Allergen or segregation group	Technical	Shown to the operator where configured

Questions that separate systems

- Who can change a lot's status, and is that change signed and kept in history?
- Which rules can a supervisor override at the station, and how is the override shown to the reviewer?
- What happens to a lot that goes on hold after it was dispensed but before the batch is made?

Software does not decide fitness for use. A lot status reflects a person's decision. Treat any claim of automatic quarantine or release as something to test, not assume.

8 • READINGS

At the scale: readings against tolerance

The operator should see target, band and live reading together, and the record should keep what the scale reported.

FIELD ON EACH WEIGHING	EXAMPLE	WHY
Gross / tare / net	52.40 / 7.40 / 45.00 kg	Shows how net was derived
Target and band	45.00 kg $\pm$ 0.225 kg	The reading is judged against the version's tolerance
Source lot and container	RM-12 lot L-2207, container 3	Genealogy
Station and scale	Booth D1, scale D1-FLOOR	Links the reading to the instrument and its calibration status
Who and when	Operator login, timestamp	Attributable and contemporaneous
Out of band	Per your rules: re-weigh, adjust or exception with reason	Exceptions are visible to the reviewer

Connected and manual readings

- **Connected:** the value comes from the scale set up for the station; confirm the connection at set-up with a live test.
- **Manual entry:** where allowed by your procedure, record that it was manual and who entered it.
- **Corrections:** the original value is kept, with reason and who corrected it.

Small quantities and micro ingredients

Colours, flavours, actives and premixes are small but often critical. Record every portion and let the total be the sum.

PORTION	CONTAINER / LOT	NET	RUNNING TOTAL VS 350 G ± 1.0 G
1	CL-7 lot C-1180, jar 1	200.2 g	200.2 g
2	CL-7 lot C-1180, jar 1	120.1 g	320.3 g
3	CL-7 lot C-1194, jar 2 (new lot)	30.0 g	350.3 g — within band

CHECK	WHAT GOOD LOOKS LIKE	OK
Suitable scale	A precision scale whose resolution suits the band; your choice.	☐
Portions recorded	Each portion with its own container and lot.	☐
Lot change mid-line	Second lot recorded, so both appear in genealogy.	☐
Line clearance	Recorded before the next material, per your procedure.	☐
Second person	Sign-off where your rules require it.	☐

Where micro weighing goes wrong. Totals typed at the end, unrecorded lot changes and cross-contact between colours. Ask how each shows on the record.

Stations, scales and set-up

A station is a place, a screen and the devices assigned to it. Set-up decides which scale a reading comes from.

TOPIC	BUYER REQUIREMENT	CHECK IN EVALUATION
Station definition	Booth, room or line with its devices	Can a work order use several stations in parallel?
Scale connection	Confirmed at set-up with a live test	Test with your actual scale models and indicators
Printers and scanners	Labels and scans at the station	Which label printers and scanners have you used?
Calibration status	Due date held on the asset	What the operator sees when a device is due or overdue, on your set-up
Network and offline	Behaviour if connection drops	What is stored, and what is re-entered?
Deployment	Cloud, private cloud or on-premises	Which option suits your IT and validation approach?

Bring your hardware to the trial. Scale protocols and indicators vary. Test the exact models you will use.

Calibration is separate. Software can show a due date; your calibration programme proves the scale. See the Calibration & Asset Control Buyer Guide.

Start-of-shift readiness at a station

CHECK	WHAT GOOD LOOKS LIKE	OK
Scale	Level, clean, zeroed; daily check weight recorded per your procedure.	☐
Calibration	Not overdue; what the operator sees if it depends on your set-up.	☐
Scanner	Reads a material label and a container label.	☐
Printer	Prints a container label with the right lot and quantity.	☐
Connection	Live reading reaches the screen; manual entry, if allowed, is marked as manual.	☐

Integration boundary. V5 guides device pairing with a live test. Which models, indicators and connection types work on your site is confirmed with your hardware, not assumed from a list.

One person, two people and electronic signatures

Not every line needs a second person. Decide where independent checking adds value, then make it part of the record.

Single person

Operator scans, weighs and signs under their own login. Common for most lines.

Second person

A colleague confirms identity, lot and quantity, then signs. Often for actives, allergens or micro lines.

Review

A reviewer checks the completed record, starting from exceptions. Separate from release.

QUESTION	GOOD ANSWER	WATCH FOR
Who can be the second person?	A different, authorised login	The same person signing twice
What does each signature mean?	Meaning shown with the signature (performed, verified, reviewed)	Unlabelled ticks
When is the second check done?	At the time, at the station	Signatures collected at the end of shift
Which lines need it?	Set per material or step by your procedure	Blanket rules nobody follows
Where is it recorded?	On the weighing entry, in the audit trail	A separate paper log

In V5. Each person signs under their own login. Second-person sign-off follows the rules configured for your workspace. Electronic signatures are in Professional and Enterprise. Confirm the exact set-up for your materials in evaluation.

12 • CORRECTIONS

Corrections, re-weighs and exceptions

Things go wrong at the scale. A good record shows what happened and who decided, rather than hiding it.

1	Out of band Reading 4.63 kg vs 4.41–4.59 kg	RECORDED Reading, time, station	WHO DECIDES Operator, per your rule
2	Remove and re-weigh Material taken off; new reading 4.52 kg	RECORDED Both readings kept	WHO DECIDES Operator
3	Wrong lot scanned Label L-3107 scanned instead of L-3108	RECORDED Original value kept	WHO DECIDES Operator corrects with reason
4	Exception raised Procedure allows a short-dated lot	RECORDED Reason, signature	WHO DECIDES Authorised person
5	Linked deviation Repeat or significant issue	RECORDED Deviation linked to the batch	WHO DECIDES Quality decides

EVENT	RECORDED	NEVER
Correction	Original value, new value, reason, who, when	Overwritten without trace
Re-weigh	Each reading, and which one counts	Only the final reading
Exception	Rule, reason, signature, reviewer outcome	A verbal OK

Ask precisely. "Prevents" and "blocks" mean different things in different systems. Ask what the operator sees next on your set-up, and who reviews it.

The electronic dispensing record: what it must hold

When readings and steps are recorded as the work happens, the batch record is assembled from them, not written afterwards.

STEP TYPE	RECORDED	WHO SIGNS
Dispense	Lot, container, gross/tare/net, station, operator	Operator; second person where configured
Charge to vessel	Which dispensed containers, in which order	Operator
Process step	Times, settings or readings the instruction asks for	Operator
In-process check	Result against limit	Operator or QC, per procedure
Correction	Original value, new value, reason	Person making it, under own login
Review	Exceptions first, then the record	Reviewer, per your rules

Who	When	Station and scale	Material and lot	Container	Target and band
Gross / tare / net	Signatures and meaning	Corrections with reason			

Review by exception. A reviewer should see out-of-band readings, exceptions and corrections first, then the full record.

Retiring paper is your decision. Run paper and electronic records in parallel until your validation and procedures support the switch.

Issue, consume, return and yield

Dispensing is half the batch. The other half is what was charged, what came out, and what went back to stock.

MOMENT	RECORDED	WHY IT MATTERS
Issue to the job	Lots and quantities issued	Stock moves where the material actually is
Charge to vessel	Which containers, in which order	Order of addition and genealogy
Return	Unused quantity back with its lot and label	Stock stays true; lot not lost
Finished quantity	Actual output, entered or weighed	Starts the yield calculation
Yield	Expected vs actual, with variance	Shows loss, rework or measurement problems

Two ways to consume

- **Weigh as you go:** each charge is a recorded consumption.
- **Allocate now, consume at completion:** lots are allocated up front; consumption is calculated from the recipe once the finished quantity is known, spread across allocated lots in order or proportionally.

Worked yield. Batch G-3307 expected 500 kg; 487 kg packed. Yield 97.4%, variance -13 kg. A person reviews whether that is within your normal range and why.

No automatic release or posting. Expired lots, negative stock and overproduction can be permitted per workspace in V5, each recorded with the operator's signature. Release is a separate human decision; ERP posting depends on your integration.

15 • WORKED EXAMPLE

A premix worked through: WO-4410

Premix SP-9, 250 kg, version 3, booth D1. Fictional example.

MOMENT	WHAT WAS RECORDED	EXCEPTION?
Work order released	SP-9 version 3 in force; targets scaled to 250 kg	—
Salt RM-12 scanned	Lot L-2207 approved, in date	—
Salt weighed	Net 45.00 kg vs 45.00 ± 0.225	—
Spice RM-78 scanned for RM-77	Look-alike material flagged at the scan	Operator scanned the correct RM-77 container
Spice RM-77 weighed	Net 128.40 kg vs 128.00 ± 0.64	—
Dextrose lot L-3310	Expiry tomorrow; procedure allows use	Permitted exception: reason and signature recorded
Colour CL-7	Three portions, two lots, total 350.3 g	Lot change recorded
Second-person check	Micro lines checked and signed	—
Review	Reviewer opened exceptions first: wrong scan and dated lot	Accepted with comment; a person decided

What makes it defensible. Every lot, quantity, exception and decision is on the record with who and when — without retyping a single weight.

The same workflow in different words

Sectors name things differently. The record underneath is similar. These are examples, not rules; your regulations and procedures decide.

SECTOR (EXAMPLES)	MASTER RECORD	BATCH RECORD	TYPICAL SENSITIVE LINES
Food and bakery	Recipe / specification	Batch or production sheet	Allergens, salt, additives
Ingredients and premix	Formula	Blend record	Micro ingredients, vitamins, colours
Dietary supplements (US)	Master manufacturing record	Batch production record	Actives, botanicals
Cosmetics	Formula	Batch record	Preservatives, fragrance
Chemicals	Formulation	Batch ticket	Hazardous components
Pharmaceuticals	Master batch record	Executed batch record	APIs, controlled materials

What stays the same

- An approved master version, scaled to the batch.
- The right lot, checked before use.
- Readings against a band, recorded at the time, by a named person.
- Exceptions visible to a reviewer, and a human decision on the outcome.

Check your own rules. Second-person checks, signature meanings and record retention differ by sector and market. This guide does not tell you which apply to you.

Master data, migration and validation

Most weighing projects slip on data, not software. Agree who owns each item before loading it.

DATA	OWNER (EXAMPLE)	CHECK BEFORE GO-LIVE
Formulas and versions	Technical / R&D	One effective version per product; units consistent
Tolerances	Quality with technical	Each line has a band suited to its scale
Materials and barcodes	Purchasing / warehouse	Every label on the floor scans to one material
Open lots and status	Quality / warehouse	Counted, status agreed, expiry dates loaded
Stations and devices	Engineering / IT	Each scale and printer passes a live test
Users, roles and signatures	Quality / HR	Each person has their own login and correct role

Migration

- You decide which history to migrate; keep legacy records accessible for their retention period.
- Reconcile loaded formulas line by line with the approved source.

Testing and validation

- You validate for your intended use where your regulations require it, using a risk-based approach.
- Test the hard cases: wrong scan, held lot, out-of-band reading, correction, second-person check.
- Ask which validation documentation and services each plan includes.

Implementation, roles and evidence

STEP	WHAT TO DO		DONE WHEN	
1 • Formulas	Load current versions with per-unit quantities and tolerances		One formula version in force per product	
2 • Materials and lots	Material codes, label barcodes, open lots with status		Every container on the floor can be scanned	
3 • Stations	Define booths and lines; connect and test each scale		Live test passed per station	
4 • Rules	Exception, second-person and correction rules		Rules agreed by quality and production	
5 • Pilot	One product, one station, paper in parallel		Records reconcile with paper	
6 • Extend	Further products and stations		Review time measured and improving	

ACTIVITY	PRODUCTION	QUALITY	TECHNICAL	ENGINEERING / IT
Approve formula versions	C	A	R	—
Set tolerances	C	A	R	C
Station and scale set-up	C	I	—	R
Dispense and record	R	I	—	—
Approve exceptions	C	A	C	—
Review batch records	I	A/R	C	—

RFP questions and scored checklist

Formulas

- How are versions approved and made effective?
- Does tolerance travel with the version?

Scan and scale

- What exactly happens when a held, expired or wrong material is scanned?
- How are out-of-band readings handled and recorded?
- Which of our scale models have you connected?

Records

- Are gross, tare and net kept? Are corrections kept with the original?
- Can review start from exceptions?

Plans

- Which plan includes electronic signatures and second-person checks?
- Which plan includes two-signature formula approval and costing?

AREA	WHAT TO SEE DEMONSTRATED	SYSTEM A	SYSTEM B
Formula version	Our formula loaded; change approved with effective date.	_____	_____
Scaling	Targets correct for our batch sizes.	_____	_____
Wrong material	Look-alike scan handled as in the worked example.	_____	_____
Lot status	Held and expired lots flagged at the scan.	_____	_____
Tolerance	Out-of-band reading handled under our rule.	_____	_____
Micro	Portions and lot change recorded.	_____	_____
Scale	Our scale connected and live-tested.	_____	_____
Correction	Original kept with reason and who.	_____	_____
Batch yield	Expected vs actual shown; return recorded.	_____	_____
Review	Exceptions-first review on our record.	_____	_____
Total (0–3 each)		_____	_____

Where V5 fits, plans and sources

- **Every plan:** formulas and work orders, dispensing against lots, lot status and expiry checked at the scan as configured, shop-floor screens and device set-up, calibration due dates on assets.
- **Professional and Enterprise:** electronic signatures (second-person checks, permitted exceptions), two-signature formula approvals, cost/COGS.
- **Batching:** weigh-as-you-go or allocate-now, consume-at-completion; permitted expired lots, negative stock or overproduction recorded with the operator's signature, per workspace settings.
- **Confirm in evaluation:** what the operator sees and can do after a failed scan or out-of-band reading on your set-up; your scale models; deployment option. V5 does not make you compliant or validated, and people make quality decisions.

Primary sources for context; applicability depends on your sector and markets. Links reviewed 1 October 2026.

Law and regulation (where they apply to you)

- **US 21 CFR 211.101 — charge-in of components (pharmaceuticals)** — www.ecfr.gov/current/title-21/chapter-I/subchapter-C/part-211
- **US 21 CFR Part 111 — dietary supplement CGMP (master and batch records)** — www.ecfr.gov/current/title-21/chapter-I/subchapter-B/part-111
- **US 21 CFR Part 117 — food CGMP and preventive controls** — www.ecfr.gov/current/title-21/chapter-I/subchapter-B/part-117
- **US 21 CFR Part 11 — electronic records and signatures** — www.ecfr.gov/current/title-21/chapter-I/subchapter-A/part-11

Guidance

- **FDA — Part 11, Electronic Records; Electronic Signatures: Scope and Application** — www.fda.gov/regulatory-information/search-fda-guidance-documents/part-11-electronic-records-electronic-signatures-scope-and-application
- **OIML R 76-1 — non-automatic weighing instruments (international recommendation)** — www.oiml.org/en/files/pdf_r/r076-1-e06.pdf
- **EudraLex Volume 4 — EU GMP Ch. 4 documentation, Ch. 5 production, Annex 11 computerised systems** — health.ec.europa.eu/medicinal-products/eudralex/eudralex-volume-4_en
- **NIST Handbook 44 — weighing and measuring devices (legal metrology, US)** — www.nist.gov/pml/owm/nist-handbook-44-current-edition

Voluntary standards

- **GS1 General Specifications — barcodes for material and lot identification** — ref.gs1.org/standards/genspecs/

Try one formula at one station. 7-day free trial, no card required, at v5ultimate.com.