FREE VYRCO RESOURCE

Samples by cavity and shot

Guide and record for retaining context before comparing injection-molded parts.

Intermediate level | Process and quality technicians, engineers and mold maintenance leads.

Link every sample to its cavity, shot and documented condition. A practical extension of resource 06: it does not replace the defect record or the statistical plan in resource 12.

General guidance and an original VYRCO form. Not a fill-balance study or a procedure for changing machine settings. References explain sampling and simulation; they do not establish acceptance criteria for your product.

Before collecting and comparing

1. Define the question

State the observation to compare, the target population and the documented criterion. The technical owner defines sample size, frequency and selection; this form does not prescribe them. [NIST-SIZE]

2. Check identification

Link part markings to a current cavity map and its orientation. If identity cannot be established, retain 'unknown cavity'; do not infer it from the defect. Use authorized collection points only.

3. Retain shot and condition

Assign a unique ID to each part and record the shot or verifiable sequence, time and data source. Link the material lot, process revision and documented phase. Do not declare a process stable merely because it has been running for a while.

4. Separate changes

Record documented startups, stops and changes between groups. Do not attribute to a cavity a difference that also coincides with a different lot or condition. Parts from the same shot are not automatically independent replications. [NIST-SCHEME]

5. Keep the evidence

Record the characteristic, method, unit when applicable, instrument and criterion reference. Preserve originals and identified parts. If a sample or datum is missing, use 'not collected,' 'not measured' or 'unknown,' not zero or acceptable.

6. Limit the conclusion

Summarize observations and gaps only. A visual pattern by cavity does not establish fill balance or root cause. Sample adequacy requires review of the plan; do not extrapolate to the lot without that review. [NIST-POP; AUTODESK]

1 / Group plan and context

BLANK TEMPLATE. Enter authorized data only; examples are in a separate section.

Study ID / owner / comparison question
Part / drawing or specification revision
Mold / revision / cavity map and orientation
Material / exact grade / lot / record reference
Population and process phase / evidence of its condition
Authorized sampling plan / revision / approver
Included cavities and shots / selection / quantity / frequency
Characteristic / method / unit / instrument reference
Documented evaluation criterion / revision / applicable limits
Safe collection / authorized custody / storage condition

Use one plan per condition group and one result record per sample. Repeat pages or save separate copies; retain linked IDs. Do not estimate missing entries.

2 / Individual sample record

BLANK TEMPLATE. Enter authorized data only; examples are in a separate section.

Unique sample ID / study and group IDs
Cavity / map reference / confirmed or unknown identity
Shot or sequence / source of that identification
Date / time / time zone / record source
Process and material condition / changes since previous group
Status: collected / not collected / unidentifiable / reason
Original observation or reading / unit / not measured if applicable
Method / instrument / operator / measurement date and condition
Original photos and files / location and part custodian
Review: criterion applied / limitations / action / owner

Use one plan per condition group and one result record per sample. Repeat pages or save separate copies; retain linked IDs. Do not estimate missing entries.

Original FICTIONAL example

Context and scope

Fictional mold DEMO-CAV, map M-A with cavities C1 through C4; study OBS-DEMO concerns a visible mark. All names, shots and observations are invented. Quantities illustrate recordkeeping, not a recommended sample size.

Group G-A, shot S-A

C1: sample A-C1, no mark observed; C2: sample A-C2, mark observed and photo F-A2; C3: not collected; C4: sample A-C4, no mark observed. The C3 part is counted as neither acceptable nor defective.

Unidentified part

A part appears in an unlabeled bag. It is recorded as U-01, unknown cavity and shot, separately from G-A. It is not assigned to C3 to complete the set.

Group G-B, shot S-B

A material lot change is documented before S-B. B-C2 shows a similar mark. It remains an observation from a different group; it is not pooled with A-C2 as if conditions were identical.

Supported conclusion

A mark is present on identified samples A-C2 and B-C2, produced under different material lots. One planned sample is missing and another lacks traceability. This does not establish that C2 causes the defect or that the entire lot behaves this way.

Next authorized step

The owner reviews the map, traceability and plan before deciding on further collection. Any balance study, adjustment or maintenance action requires its own procedure and authorization.

Primary sources and scope

Sources accessed: 2026-10-16

NIST-SCHEME - NIST/SEMATECH e-Handbook - Choosing a Sampling Scheme

General basis: document what is collected and how, avoid confounding factors and consider independent replications. The cavity/shot form is an original adaptation, not a NIST-validated plan.

Open primary source

NIST-SIZE - NIST/SEMATECH e-Handbook - Selecting Sample Sizes

Sample size depends on purpose, variability, precision and practicality. No formulas or quantities from its examples are transferred to this record.

Open primary source

NIST-POP - NIST/SEMATECH e-Handbook - Populations and Sampling

Distinguishes sample observations from population conclusions. Does not validate representativeness or acceptance of a particular lot.

Open primary source

AUTODESK - Autodesk Moldflow 2025 - Runner Balance analysis

Simulation context: runner balance considers filling, pressure and geometry. Not equivalent to visual inspection or authorization for physical changes. Versioned 2025 reference, not a claim about the latest release.

Open primary source

Limitations and hold points

- Do not reach into a moving mold or bypass guards to complete this record; follow the applicable safety procedure.

- Do not induce short shots or change pressure, temperature, speed or geometry using this guide.

- No tolerances, balance limits, intervals, sample sizes or lot acceptance rules are provided.

- Incomplete data or uncertain identity limit comparison; retain them separately and request review.

- Does not establish causation, capability, stability or regulatory compliance. Product release belongs to authorized personnel.

Original VYRCO material, an independent project. No employer or customer data. Do not disclose confidential information when sharing this form. Contact: info@vyrco.com.