Material release: systematically inspect and approve first deliveries

Material release is the formal process by which a company determines that a supplier's material or component is approved for series production or productive use. It links quality management, procurement and production and ensures that only tested materials enter the value creation process. In practice, it is a prerequisite for a supplier being placed on the Approved Vendor List (AVL) and for regular deliveries being accepted without special inspections. A cleanly documented material release significantly reduces the risk of failures, disputes and rework costs.

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Key facts at a glance

01 Material release formally confirms that a material meets the agreed specifications and may be used productively.

02 Typical inspection content includes dimensions, materials, surfaces, documentation and, in some industries, statutory approval obligations.

03 Without material release, first deliveries in practice often remain limited to goods receipt inspection with an increased inspection effort.

04 Procedures such as initial sample inspection, B samples or capacity and process approval usually run in parallel or sequentially to the material release.

05 Changes to the material, process or supplier location generally trigger a new release (change management).

06 Material release is closely linked to the requirements specification, goods receipt inspection (AQL sampling) and the maintenance of the Approved Vendor List (AVL).

Definition: material release

Material release is the documented approval of a material or component for productive use with a defined supplier and manufacturing process. It concludes the qualification phase and authorises the supplier to deliver series quantities.

Distinction from other types of approval

Material release is not identical to drawing approval or the approval of suppliers as such. While supplier approval concerns the company as a whole, material release applies to a specific material number, often in combination with a particular plant or manufacturing process. The initial sample inspection is likewise only one component: it demonstrates the capability of the process, but does not replace the formal material release with all accompanying evidence.

Legal and contractual anchoring

Many supply contracts and quality assurance agreements stipulate that deliveries only count as series production deliveries once material release has been granted. Until then, special arrangements regarding inspection, labelling and risk assumption often apply. Which evidence is contractually owed in each individual case should always be checked in the contract; general statements do not replace case-by-case examination, particularly for regulated products.

Methods and approach for material release

In practice, the release process follows a largely standardised sequence oriented towards the requirements specification and the agreed specification. It begins with the request for inspection samples and ends with the documented release decision.

Inspection samples and initial sample inspection

The starting point is usually the initial sample inspection in accordance with an agreed sample inspection plan or comparable standards. The supplier delivers samples with measurement reports, material certificates and, where applicable, certificates. The customer checks whether all characteristics required in the requirements specification and the drawings are fulfilled. For complex components, process audits, capability evidence (process capability, often with indicators such as Cpk) and visual inspections supplement the testing.

Involved functions and decision-making

Typically, quality assurance, engineering, production and procurement are all involved. Procurement manages the process, monitors deadlines and embeds the release in supply contracts and purchase requisitions. The decision is recorded: release, release with conditions, or rejection with remediation. In many companies, the documentation takes place in a PLM or QM system, which links the material release directly to the material number.

Re-release following changes

Any significant change – to the material, the manufacturing process, the supplier location or the drawing – triggers a requalification. The change management system defines which changes are subject to notification and whether a full or reduced initial sample inspection is sufficient. Without clear notification obligations, there is a risk of uncontrolled process changes at the supplier, which only become visible late as quality problems.

Key KPIs and inspection content

The success of the release process can be measured. Common metrics concern lead time, the quality of submitted samples and the stability of released materials in series production.

Process metrics

Typical benchmark figures in practice: the first pass of the initial sample inspection should often achieve a deviation rate of below around ten per cent of the characteristics inspected; otherwise there is a need for action regarding the specification or the supplier. The replenishment lead time for resubmitted samples and the duration of the entire release are often recorded as cycle time and benchmarked internally.

Quality metrics after release

After release, acceptance figures at goods receipt, the results of goods receipt inspection (AQL sampling) and complaint rates show whether the release decision was sound. If quality deteriorates, the inspection intensity can be increased or the release made subject to conditions. Supplier process data, for example from statistical process control (SPC), supplements the assessment and makes trends visible at an early stage.

Risks and controls in material release

Errors in material release have a direct impact on security of supply and product quality. Materials released too late delay ramp-ups; materials released too early risk series defects.

Typical risks

Common weak points are incomplete specifications, a lack of measurement capability at the customer, time pressure and concealed process changes at the supplier. Dependence on subcontractors also plays a role: without Tier-n transparency, it remains unclear whether critical upstream products or required recycled content quotas are actually being met. In sole-source decisions, the risk is amplified because a failure directly affects security of supply.

Control instruments

Effective controls include a binding release workflow with defined release-authorised persons, change management with notification obligations, and contractual inspection and audit rights such as the Right to Audit. Reduced or enhanced goods receipt inspection according to release status keeps inspection effort proportionate to the risk. In addition, supply chain analytics and data quality KPIs provide indications of whether master data and release statuses are consistent across systems.

Transition to series monitoring

Qualification does not end with release: audit plans, cycle counting of measuring equipment and regular supplier evaluations secure the status quo. In the event of repeated deviations, the supplier may

temporarily be downgraded to enhanced inspection or – in the case of serious deficiencies – removed from the Approved Vendor List (AVL).

Current developments in material release

Digitalisation, sustainability requirements and turbulent supply chains are noticeably changing the classic release process.

Digitalisation of release processes

More and more companies are shifting initial sample inspection and material release into digital workflows, in some cases integrated with e-procurement systems. Electronic inspection reports, digital measurement data transfer and automated status queries shorten lead times and improve traceability. The prerequisite is a clean data model that uniquely links material, supplier, location and release status.

Sustainability and regulatory requirements

Increasingly, sustainability evidence is being incorporated into material release: information on recycled content, provenance evidence for critical raw materials or declarations of conformity for substances in supply chains. Depending on the industry and target market, additional obligations may exist; their specific design should be examined on a case-by-case basis. Procurement professionals already anchor these requirements in the requirements specification so that they do not have to be added subsequently.

Resilient supply chains and dual qualification

In view of supply failures, many companies are deliberately qualifying second sources in order to increase security of supply. The approved second supplier is usually incorporated with defined sourcing shares in accordance with the sourcing wave plan. However, dual sourcing also increases the workload: every second source means a second full material release, complete with inspection samples and process evidence.

Typical metrics

Metric	Typical value
First-Pass-Yield of the initial sample inspection	often > 90% *Proportion of characteristics without deviation in the first pass*
Lead time for material release	typically 4–12 weeks *depending on complexity and industry*
Acceptance rate after release (goods receipt)	> 98% *indicative of stable series quality*

Complaint rate for released materials	< 1% *benchmark figure; to be interpreted on an industry-specific basis*

Practical example

A medium-sized mechanical engineering company introduced a new aluminium die-cast housing. The first initial sample inspection revealed deviations in dimensional accuracy and surface quality; the material release was therefore granted with conditions. Full release was only granted after process adjustments at the foundry supplier, a repeat initial sample inspection and successful goods receipt inspection (AQL sampling) of two delivery lots.

- Release decision with conditions documented and linked to the material number in the QM system
- Enhanced incoming inspection of the first three series lots before transition to reduced inspection
- Contractual notification requirement for process and location changes added, including a Right to Audit
- Supplier's capacity evidence obtained before series ramp-up to safeguard security of supply

Conclusion

Material release is a central quality gate step between supplier qualification and series supply. It combines technical testing, contractual provisions and system-supported documentation, and thus has a direct impact on quality, deadlines and costs. Those who anchor release criteria early in the requirements specification, consistently track changes and use process metrics significantly reduce complaints and ramp-up problems. At the same time, release becomes a lever for security of supply, for example through structured second-source qualification. Investment in a lean, digital release process quickly pays off in practice.

Frequently asked questions

? What is a material release?

Material release is the formal, documented approval of a material or component for productive use with a specific supplier and process. It is based on test results such as the initial sample inspection (first article inspection) and further supporting evidence. Only once release has been granted are deliveries generally regarded as series production deliveries.

? Who grants the material release?

Often an interdisciplinary committee comprising quality assurance, engineering, production and procurement takes the decision. Operational management usually lies with procurement or quality assurance, depending on the company's organisation. Clearly defined release authority and complete documentation are essential.

? What is the difference between initial sample inspection and material release?

The initial sample inspection is the technical proof that samples meet the specification. The material release is the approval decision built on this, which also takes into account further aspects such as process capability, capacities, documentation and the contractual situation. A passed initial sample inspection therefore does not automatically lead to release.

? When must a material be released again?

Typically in the event of significant changes to the material, the manufacturing process or the location, when changing subcontractors, or after extended production pauses. Which changes are subject to notification requirements is governed by the quality assurance agreement and the change management system. Where in doubt, the rule is: requalify conservatively.

? What happens if material is delivered without release?

In practice, such deliveries are blocked, subjected to enhanced inspection or rejected; the allocation of risk is governed by the supply contract. Unreleased materials are often not permitted to enter production. Repeated violations can lead to downgrading or removal from the Approved Vendor List (AVL).

? How long does a material release take?

The duration depends heavily on complexity, industry and scope of testing; in practice, several weeks to a few months are common, and considerably longer for regulated products. The decisive factors are sample provision, performance of measurements, internal coordination and, where applicable, resubmission of samples. Clear schedules and digital workflows noticeably shorten the lead time.

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