

Series production approval process: The controlled path from sample acceptance to series delivery

The series production approval process is the formalised procedure by which a company releases a component, assembly or finished product for series delivery. It combines qualification, inspection and contractual stipulation into a traceable transition from development to mass or series production. Without a clearly regulated series production approval process, buyers and suppliers risk quality deviations, disputes over responsibilities and unplanned stoppages. This article describes the process, KPIs, controls and current developments from a buyer's perspective.

Key facts

- The series production approval process governs the formal transition from sample production (e.g. B samples, prototypes) to series production.
- Typical stages are initial sample submission, measurement report, documentation, internal review by the supplier and final approval by the customer.
- In the automotive and supply industry, the PPAP process is the best-known form; other industries use comparable procedures with similar requirements.
- Without written approval, suppliers should not start series deliveries – this should be secured contractually.
- Changes to the product or process after approval generally require a re-approval or change confirmation.
- KPIs such as first-time-throughput, the proportion of approval documents submitted on time and the rework rate make the process measurably manageable.

Definition: series production approval process

The series production approval process refers to the structured, documented transition of a product or component from the sample stage to series production. It encompasses the examination of product, process and documentation capability and ends with a binding approval declaration. Only after this approval may regular series volumes be delivered and invoiced.

Distinction from sample acceptance

Sample acceptance confirms that an individual piece or a small pre-series meets the agreed specifications. The series production approval process goes beyond this: it examines whether the supplier can produce the series volume repeatably with stable process control, the planned lead time and suitable inspection equipment. In practice, the two steps are often interlocked in timing but documented separately. Only those who demonstrate process capability – frequently evidenced by capability indices such as Cpk – are considered ready for series production. For buyers, the distinction is important because contracts typically only trigger framework volumes, prices and delivery obligations

with series production approval.

Industry differences

The automotive industry has established a standardised catalogue of approval documents with PPAP (Production Part Approval Process). In the electrical and electronics industry, for example with EMS providers, functional tests and design verification also play a role. In mechanical and plant engineering, customer-specific approval protocols with measurement reports and material evidence dominate. Medical technology and aviation require regulated procedures with special documentation obligations. Buyers should therefore define, per supplier, which standard applies and anchor this in drawings, requirement specifications and framework agreements – uniform requirement lists prevent later discussions about scope and evidence volume.

Process and phases of the series production approval process

A practical series production approval process typically follows five phases: request, initial sample submission, evaluation, decision and follow-up support. Each phase has clearly defined entry and exit criteria so that all parties involved – purchasing, engineering, quality, logistics and the supplier – know the same status.

Preparation and request of the approval documents

The process begins with the approval request to the supplier, ideally linked to the sourcing market selection and the technical drawings. In practice, the supplier frequently provides: measurement reports with inspection point numbers, material certificates, process evidence (such as capability studies), outgoing inspection results and, where applicable, approval evidence. Buyers should define a checklist in advance specifying which documents are to be provided in which form (paper, PDF, data portal). The availability of material for the initial order should also be clarified, for example by coordinating with the supplier's capacity planning, so that no gap arises between approval and the first series delivery.

Initial sample submission and evaluation

During the initial sample submission, the supplier supplies parts from the planned series infrastructure – not from special production. The samples are technically inspected, frequently using a measurement plan covering all relevant characteristics. In parallel, quality and engineering assess process and documentation capability. In practice, it has proven useful to apply scoring schemes with point values for individual criteria so that decisions are traceable and comparable. In the event of deviations, the supplier's control of nonconforming process is required: deviations must be documented, classified and provided with corrective actions before approval is granted or granted with conditions.

Decision, approval documentation and re-approval

The approval decision is usually made by a defined committee or approval body comprising purchasing, quality and engineering. The result is documented: approved, approved with conditions or rejected. The approval documentation should state the validity period, the approved drawing version, the process status and, where applicable, conditions. Subsequent changes to drawings, materials or processes trigger a re-approval. Buyers should stipulate contractually that the supplier reports change intentions in advance and does not deliver modified parts until confirmation has been received. This protects against silent changes with incalculable consequences for assembly and certification.

Key KPIs in the series production approval process

Measurable KPIs reveal whether the process is working quickly and stably or whether it is becoming a bottleneck. In practice, a few, deliberately selected KPIs that are regularly discussed in the supplier review have proven effective.

Time and deadline KPIs

The key metric is the approval lead time: the period from the request for documents to the final approval. Typically, this is several weeks to a few months depending on complexity; the decisive factor is the comparison against the planned milestone date in the project schedule. In addition, the proportion of approvals that go through on the first attempt – i.e. without subsequent document submissions – is measured (first-pass rate). The proportion of complete approval packages submitted on time before the series launch also belongs here. These figures can be compared well with the BANF-PO lead time in operational purchasing to distinguish bottleneck causes: is it the supplier or internal processing?

Quality-related KPIs

After approval, the quality of the approval decision becomes apparent in the defect record: first-delivery zero-defect rate, rework and scrap rates, and the number of open deviation notifications in the first weeks of series production. The rate of approvals with conditions is also frequently tracked, as in practice these can be a harbinger of later problems. It is also useful to track the process capability of critical characteristics (capability indices) across the first series lots. Anyone who maintains a history of these metrics per supplier can agree realistic target values at the next supplier qualification and address risks earlier.

Risks and controls in the series production approval process

The greatest risks lie less in technical errors than in unclear responsibilities, missing documentation and silent changes. Controls must therefore be anchored organisationally and contractually alike.

Typical risks

Common risk areas are: series launch without complete approval (so-called soft approval), which later proves costly; lack of process capability despite adequate samples; unclear versioning of drawings and inspection plans; silent changes to materials, subcontractors or production site. There are also data-related risks: anyone passing sensitive design data to suppliers should regulate data control and access rights. In international supply chains, compliance topics come into play, such as conflict minerals proof of origin or child labour risk assessment in high-risk sourcing markets – topics that are increasingly being requested in approval documents as well.

Control mechanisms and contractual anchors

Effective controls begin with an approval stop: no series delivery and no invoicing without documented approval – this should be stated in the framework agreement or the general terms and conditions of delivery. The second pillar is audits: before approval, the customer inspects the process on site in high-risk cases, supplemented by a supplier energy audit where energy efficiency or CO2 pricing relevance is a factor. The third pillar is change monitoring: suppliers commit to making every change notifiable. In the event of impending delays, contractual escalation instruments help; an escalation clause with defined stages prevents approval delays from getting lost in day-to-day business.

Current developments and digitalisation

The series production approval process is becoming increasingly digital. Instead of paper folders with measurement reports, companies are increasingly using data portals in which suppliers upload documents and inspectors evaluate them on a status basis. This shortens lead times and improves traceability.

Digital approval platforms and data integration

In practice, digital supplier portals are gradually replacing email-based procedures. Advantages lie in version control, auditability and the automation of reminders. Coupling with procurement systems is important: approval status, part master data and purchase requisition should be consolidated so that no order is triggered for a part that has not been approved. The connection to availability planning via Available to Promise (ATP) in the supplier's ERP is also gaining importance, so that after approval the on-time delivery of the first delivery is secured. When introducing such platforms, buyers should nevertheless ensure that small suppliers are not overwhelmed; tiered requirements have proven effective.

Sustainability and regulation

With the Corporate Sustainability Due Diligence Directive (CSDDD) and the Corporate Sustainability Reporting Directive (CSRD), sustainability evidence is moving more strongly into supplier qualification and approval. In practice, customers are increasingly requesting emissions data, energy and working conditions already in the approval package. This expands the classic scope: in addition to technical evidence, sustainability declarations, audit reports or conflict minerals declarations may be included. Buyers should tier the scope on a risk basis so as not to overload suppliers with uniform but oversized requirement catalogues. Legal bases and the scope of obligations must be examined on a case-by-case basis; this article does not constitute legal advice.

Typical metrics

Approval lead time: several weeks to months

Period from approval request to decision; varies greatly depending on part complexity

First-pass rate: > 80 %

Proportion of approvals without subsequent document submissions; typical benchmark

Proportion of on-time approval packages: > 95 %

Complete documents before series launch; common target in supplier reviews

Approvals with conditions: < 10 %

High proportions in practice indicate later quality risks

Practical example

A mid-sized mechanical engineering company awarded a precision-forged housing part to a new supplier. At the first series launch it became apparent: the samples had come from a special production run, and the supplier's series press could not consistently achieve the required tolerances. The series launch threatened to slip by eight weeks. The buyer subsequently reorganised the process:

- Mandatory sample extraction from the planned series line, including process capability evidence for critical characteristics

- Digital approval checklist with clear allocation of responsibilities between purchasing, quality and the supplier
- Contractual approval stop: no series delivery and no invoicing without documented approval
- Change notification obligation with defined re-approval for drawing, material or site changes

Conclusion

The series production approval process is the hinge between engineering success and a stable series supply. It only pays off if it is consistently documented, contractually secured and accompanied by measurable KPIs. Buyers should agree the approval scope, responsibilities and change rules with the supplier at an early stage and consistently follow up on deviations. Digitalisation and sustainability requirements expand the scope but do not change the core logic: first provide evidence, then deliver. Anyone who practises this discipline reduces the risk of stoppages and builds trust for long-term supply relationships.

Frequently asked questions

What is the series production approval process?

The series production approval process is the formalised procedure by which a component or product is released for series production after successful sample acceptance. It examines product quality, process capability and documentation. Only once the approval has been documented may regular series volumes be delivered.

What is included in a series production approval?

Typically, the approval package includes measurement reports, material certificates, process capability studies, inspection plans and, where applicable, approval and sustainability evidence. The exact scope is defined by industry and risk, for example according to PPAP in the automotive industry. What matters is that the documents reflect the series production process status.

How long does a series production approval process take?

The lead time varies considerably depending on the complexity, industry and risk class of the part. In practice, several weeks to a few months are common, and longer for complex safety-relevant components. What matters is tracking deadlines against the planned series launch and measuring the first-pass rate.

What is the difference between sample acceptance and series production approval?

Sample acceptance confirms the conformity of sample parts with the specification. Series production approval additionally demonstrates that the manufacturing process can produce the series volume stably and repeatably. Only the latter regularly establishes the obligation to deliver and invoice series volumes.

When is a re-approval required?

A re-approval is typically required for changes to drawings, materials, manufacturing process, production site or key subcontractors. A renewed approval may also be sensible after a prolonged production interruption or in the event of recurring deviations. The trigger criteria should be laid down contractually.