Toll Manufacturing: managing contract manufacturing strategically and operationally

Toll manufacturing refers to contract manufacturing in which a company provides the contract manufacturer with all materials, components or semi-finished products, and the latter solely performs the processing operation. The client remains the owner of the material and the products created, while the manufacturing partner receives remuneration only for its service. For buyers, toll manufacturing is an alternative to in-house production and contract manufacturing that flexibilises capacity and reduces investment. The term is often used synonymously with contract processing or contract manufacturing.

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Key facts at a glance

01 In toll manufacturing, the client provides material, drawings and know-how; the manufacturing partner provides only machinery, personnel and process expertise.

02 Ownership of the material and the products remains with the client throughout the entire process.

03 Remuneration is typically per unit, per machine hour or based on lot size – without any material profit margin for the manufacturer.

04 Typical use cases are capacity peaks, specialised processes without in-house equipment and confidentiality of sensitive recipes or designs.

05 Essential contract contents are material loss rates, quality agreements, liability issues and reporting processes.

06 The distinction from contract manufacturing, in which the supplier procures itself, is relevant for contracts, customs and tax and must be examined on a case-by-case basis.

Definition: toll manufacturing

Toll manufacturing is a form of industrial job-order manufacturing in which the client provides the contract manufacturer with all essential input materials, and the latter merely performs the finishing, machining or assembly process. Legally, it is typically based on a contract for work or a contract for work and materials; the processed material remains the property of the client. The distinction from contract manufacturing, in which the manufacturing partner procures material and components itself, is clear in principle but must always be examined in detail in practice for contract, customs and tax purposes.

Distinction from contract manufacturing

In contract manufacturing, the supplier independently purchases raw materials, intermediate products and bought-in parts and delivers finished products. In toll manufacturing, only the client procures; the manufacturer bears only the process risk. This differentiation influences pricing, availability responsibility, customs value and balance sheet treatment. Buyers should clearly name the chosen arrangement in the contract, as ambiguous designations can later lead to disputes over liability, insurance and delivery availability.

Typical industries and processes

Toll manufacturing is frequently found in the chemical and pharmaceutical industries (contract filling, toll synthesis), in metal processing (heat treatment, electroplating, machining), in plastics processing (injection moulding, extrusion) and in the food industry. Common to all cases is that the client does not want to or cannot possess the specialised technology, for example because investments would be uneconomical or capacity is only needed periodically. Contract manufacturing is also widespread for sensitive recipes or design data, since the client can keep the input materials under lock and key.

Methods and procedure for awarding contract manufacturing

The award of toll manufacturing follows structured steps: from a precise requirements specification, through the selection and assessment of suitable manufacturing partners, to contractual fixation and operational management. Since the client supplies the material and technical planning, process responsibility lies largely on its side – a clean preparation determines profitability and quality.

Clarify requirements and select manufacturing partners

The starting point is a clear requirements specification with drawings, bills of materials, tolerances, inspection characteristics and, where applicable, material data according to classification standards such as ECLASS. On this basis, market segmentation is carried out in procurement in order to identify suitable manufacturing segments and regions. Potential partners are assessed against defined qualification criteria: plant capacity, process certifications, references, capacity reserves and logistical connections. A structured request for quotation with uniform charging rates – for example per machine hour or per unit – enables a comparable quotation comparison; the bid opening should be documented and traceable.

Contract, costing and terms

In addition to contract rates, the contract manufacturing agreement typically regulates material loss rates (typically a few per cent depending on the process), billing of excess quantities, scrap liability, tool usage, confidentiality and capacity commitments. Price responsibility for incoming material and the disposal of waste or chips should be expressly agreed, as value flows run through these. Quality assurance is anchored through inspection agreements, inspection plans and provisions on the serial release process. For international partners, customs, export control and the chosen delivery clause – for example Incoterms DAP or Incoterms CPT – should be clarified at an early stage; tax and customs details require expert review on a case-by-case basis.

Sample production and ramp-up

Before serial production, a sample or first-article stage has proven its worth, documented as part of the serial release. Process parameters, tools, inspection methods and cycle times are thereby bindingly defined. A supplier development plan helps to systematically eliminate weaknesses identified after the ramp-up. Only after successful release should lot size planning – for example using the Andler lot size – be switched to the new manufacturing stage.

Key KPIs for managing toll manufacturing

Since the client provides the material and planning, performance measurement of the contract manufacturer is central. Established key figures capture reliability, quality and material utilisation and form the basis for regular supplier evaluations and strategic decisions.

Delivery and process metrics

Core metrics are delivery reliability (OTIF), lead time from material receipt to dispatch request and capacity utilisation of the agreed equipment times. The carrier performance of the transport service providers used also forms part of the assessment when the client is responsible for logistics. These key figures should be discussed in regular performance reviews with the manufacturing partner and, in the event of deviations, pursued with measures from a supplier development plan.

Quality and material metrics

Material yield and the actual loss rates compared with the contractually agreed rate are particularly meaningful in toll manufacturing, as lost material goes directly at the client's expense. Additionally relevant are the first-pass yield rate, the complaint rate and the lead time of 8D containment measures for quality deviations relevant to serial production. For substances and mixtures, documents such as the certificate of analysis supplement batch release and should be available completely and on time.

Risks and controls in toll manufacturing

The dominant risks lie in material losses, quality deviations, capacity bottlenecks at the manufacturer as well as in confidentiality and compliance. Since the client bears ownership and technical

responsibility, it needs effective control mechanisms across the entire process chain.

Quality, complaints and blocked stock

Defective lots in toll manufacturing frequently also affect the client's supplied material – a double loss of value. Contracts should therefore contain provisions for blocked stock, disposal of scrap and liability for material losses. For serious deviations, a structured 8D containment is part of the standard repertoire, supplemented by documentation requirements, such as inspection findings and, where required, a certificate of analysis per batch. Residual materials such as chips, shredded material or distillation residues should be clearly assigned contractually.

Availability, business continuity and compliance

The failure of a specialised contract manufacturer can directly jeopardise one's own ability to deliver. A business continuity plan (BCP) should include qualified alternative manufacturers, material transfer options and emergency logistics. With single-product manufacturers there is also the risk of strategic dependency, which can be mitigated through second sources or targeted nearshoring. From a compliance perspective, export control, where applicable proof of origin and, for steel and aluminium products, the long-term supplier's declaration (LLE) must be observed when customs-cleared products are placed on the market. Irregularities in the ordering process – such as circumventing defined approval routes – should be prevented through clear governance in order to exclude maverick buying in the sensitive contract manufacturing environment.

Know-how protection and confidentiality

The manufacturer gains insight into designs, recipes or process chains. Confidentiality agreements, restrictions on subcontractors, documented access rights and, where required, visit and audit rights are therefore indispensable contract components. Intellectual property in process improvements developed during the collaboration should also be expressly regulated.

Current developments: toll manufacturing in transition

Toll manufacturing is gaining importance in many industries because capacity flexibility, investment conservation and risk diversification are becoming increasingly important. At the same time, resilience strategies, digitalisation and regulatory requirements are changing the way contract manufacturing relationships are established and managed.

Resilience and regionalisation

Supply risks in recent years have led companies to structure their manufacturing networks more regionally. Nearshoring also affects contract manufacturers: shorter transport routes, smaller time zone differences and easier audits increase controllability. Many procurement organisations are therefore anchoring contract manufacturing partners more strongly in their supplier strategy and, as part of contract renewal, examining whether existing contracts should be adapted to changed capacity and risk situations.

Digitalisation of collaboration

Digital interfaces for order transfer, stock reconciliation and reporting shorten lead times and reduce media discontinuities. Material stocks at the contract manufacturer should be mapped on a consignment-like or value-flow-neutral basis so that ownership and availability are transparent at all times. Billing processes can be simplified via self-billing based on reported completion quantities, provided quantities and quality are bindingly documented. AI-supported tools increasingly support the creation of tender documents and the evaluation of enquiries in the award process.

Typical metrics

Metric	Typical value
Delivery reliability (OTIF)	typically > 95% *Proportion of on-time and complete delivery collections per agreed date*
Material yield	process-dependent, frequently 95–99% *Review deviations from the contractually agreed loss rate directly with the manufacturer*
Lead time from material receipt to dispatch	typically a few days to a few weeks *Process-specific; define as a benchmark per order type*
Complaint rate	target frequently < 1% *In addition: processing time for 8D containment measures*

Practical example

A mid-sized mechanical engineering company with strong seasonal order peaks does not carry out a special heat treatment and coating of steel components itself. Previously, parts were awarded to changing service providers, which led to quality fluctuations and long lead times. Procurement established a structured toll model with two qualified partners.

- Creation of a detailed requirements specification including an inspection plan and loss-rate specifications as an annex to the framework agreement
- Structured selection of two manufacturing partners based on defined qualification criteria with reference visits and capacity evidence
- Anchoring of 8D containment, serial release process and monthly KPI reviews in the contract
- Establishment of a BCP with a qualified alternative manufacturer and agreed lead times for capacity peaks

Conclusion

Toll manufacturing is more than short-term capacity rental: those who systematically integrate contract manufacturing into their supplier strategy gain flexibility in investments and scalability in production. Decisive factors are a precise specification, a contract that clearly regulates material losses, liability and confidentiality, as well as robust KPIs for ongoing management. Risks from dependency and failures can be limited through second sources, business continuity planning and regional diversification. Buyers who professionally manage selection, contract and performance management turn contract manufacturing into a competitive component of their value creation.

Frequently asked questions

? What does toll manufacturing mean?

Toll manufacturing refers to contract manufacturing (Lohnfertigung), in which the client provides the material, components and technical documentation, and the manufacturing partner only performs the processing operation for a fee. Ownership of the material and the products remains with the client. By contrast, in contract manufacturing the manufacturer procures the materials itself.

? What is the difference between toll manufacturing and contract manufacturing?

The key difference lies in procurement responsibility: in toll manufacturing the client supplies the material and pays only processing fees, whereas in contract manufacturing the supplier procures and delivers the finished product. Consequently, availability risk, costing and customs treatment shift. The chosen arrangement should be clearly specified in the contract.

? When does contract manufacturing make sense for companies?

Contract manufacturing typically pays off during capacity peaks, for specialised processes without in-house equipment, with low utilisation forecasts or under high investment pressure. It offers flexibility but shifts planning, logistics and part of the quality responsibility to the client. A make-or-buy analysis considering volumes, know-how and dependency risks is the basis for the decision.

? How is toll manufacturing billed?

Billing is commonly done per unit, per machine hour or based on lot size, without any material margin for the manufacturer. In addition, set-up times, special inspections, tooling costs and storage services can be agreed. In practice, it has proven useful to define loss rates, excess quantities and scrap liability contractually; billing can be simplified via self-billing based on reported completion quantities.

? What are the risks of toll manufacturing?

The main risks are material losses and quality defects at the client's expense, capacity bottlenecks at the manufacturer, know-how leakage and supply failure risks with specialised manufacturers. Countermeasures include clear loss-rate provisions, audits, 8D processes, second sources and a

business continuity plan. Customs, export control and tax classification should also be reviewed by qualified experts.

? How do you find suitable contract manufacturers?

Suitable partners are identified through market analyses and defined qualification criteria: equipment technology, certifications, capacities, references and logistics connections. A structured request for quotation with uniform charging units enables a fair comparison. Before serial release, sample parts, audits and process definitions should secure the ramp-up.

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