

Special Characteristics: mastering key characteristics – from definition to incoming inspection

Special Characteristics (SC) are product and process characteristics whose failure or deviation can directly jeopardise the safety of persons, legal compliance or the function of the end product. They play a central role in industrial procurement because requirements for key characteristics must be communicated to suppliers on a binding basis, anchored contractually and monitored in production. Buyers who do not handle Special Characteristics systematically risk complaints, scrap, returns and, in the worst case, liability risks. The following article explains the term, presents practical approaches and links the topic to typical procurement processes such as specification management, requests for quotations and quality management in procurement.

Key facts

- Special Characteristics are safety- or function-critical characteristics with increased requirements for manufacture and inspection.
- They are typically marked using symbolic markings in drawings, bills of materials or data systems.
- Binding frameworks include IATF 16949, VDA specifications and customer-specific requirements of the automotive and aerospace industries.
- In procurement, SC requirements must be explicitly communicated in the specification, RFQ and order documents.
- Suppliers frequently confirm their control of the characteristics by means of a supplier declaration (e.g. Initial Sample Report with designated SC entries).
- In practice, defects on Special Characteristics are considered a major cause of high complaint rates, containment measures and quality-related contractual breaches.

Definition: Special Characteristics

Special Characteristics are characteristics of a product or process that have been classified as particularly important due to legal requirements, safety requirements or critical function. Their variation or failure can directly impair the safety of persons, compliance with legal requirements or the function of the product. The term originates from the automotive industry and has become established across industries through standards such as IATF 16949 as well as the VDA publications on 'safety-related parts' and 'special characteristics'.

Distinction from normal characteristics

Not every critical characteristic is automatically a Special Characteristic. The difference lies in the consequence of deviation: with standard characteristics, a deviation typically leads to rework or sorting, whereas with an SC it leads to potential safety, legal or total failure risks. Companies therefore usually use a three-tier methodology: standard characteristics, Critical Characteristics (mainly legal and safety)

and Significant Characteristics (important characteristics with function-critical relevance).

Product and process characteristics

A distinction must be made between product-related characteristics such as a minimum residual wall thickness, a torque or the conductivity of a contact layer, and process-related characteristics such as welding current, process cooling or the wet film adhesion of a painting process. Process characteristics are managed as so-called specialised process characteristics because they significantly control the stability of the characteristic values on the product. In procurement, the product-side communication in order documents and the process-side assessment of supplier capability are relevant.

Methods and approach: anchoring SCs in the procurement process

Controlling Special Characteristics begins long before the first order. They must be consistently communicated from engineering through specification management to the supplier relationship. Buyers take on the role of transmitter and verifier: what Development declares as an SC must reach the supplier completely, traceably and verifiably.

Requirements in specifications and RFQs

In specification management, SCs are uniquely identified, dimensioned, inspected and marked with symbols. In a Request for Quotation (RFQ), the SC list, associated inspection instructions and expected evidence formats (e.g. measurement protocols, process capability analyses, inspection plan according to APQP) are a firm part of the RFQ content. Only then can the supplier calculate its quotation realistically, because increased inspection and documentation costs typically cause higher process costs, which would otherwise resurface later as line items in price negotiations.

Supplier selection and approval

In supplier selection, the ability to control SCs is a hard criterion: process capability evidence (Cpk values typically ≥ 1.33 , for safety-related characteristics frequently ≥ 1.67), reaction plans in the event of limit value exceedance and certified management systems must be assessed. In practice, the approval workflow comprises sample approvals (PPAP or sample inspection report), initial sample approval and the approval of special and change processes. Only after completed approval should an order confirmation process or the series order start.

Communication in order documents

SC requirements must be referenced in the purchase order, the call-off contract or framework agreements – for example by reference to the drawing revision, validity date and applicable marking rule. Order confirmation checks are important: the buyer verifies whether the supplier has confirmed the referenced drawing revision and the SC requirements. For long-running framework contracts with automatic contract renewal, it must also be checked whether updated SC requirements are incorporated by means of amendments or updated annexes.

Key KPIs for controlling Special Characteristics

The effectiveness of SC management can be measured. In practice, KPIs have become established that reflect both process quality at the supplier and the buyer's own methodology. It is important not to view the KPIs in isolation but in conjunction with classic procurement metrics.

Quality and process metrics

Key metrics are the complaint rate, the proportion of complaints with SC relevance out of all complaints, and the First Pass Yield for critical characteristics. On the process side, metrics such as Cpk and Ppk for SC characteristics provide indications of the supplier's process stability. In initial communication, requirements for reporting intervals and analyses should be defined in the contract or quality agreement.

Procurement-side metrics

From a procurement perspective, the proportion of parts with SCs in the own category structure (which can be linked to the Kraljic matrix for risk classification), the proportion of complete SC documentation in new part introductions, and the time from SC update to confirmation by the supplier are relevant. Inventory analysis and the level of safety stock for SC-bearing parts are also revealing: for safety-related parts, higher stock levels are often justified because an exclusion criterion (Stop Ship) reduces availability at short notice.

Risks and controls: where SC management fails

The most common causes of error lie not in the technology but in the transfer of information: SC requirements get lost between engineering, RFQ, order and supplier. The result is incorrectly manufactured parts that are only discovered late – with high containment and replacement costs.

Typical weak points

Frequently observed problems: drawing revisions in order documents differ from the current approved version, SC symbols are missing from the bill of materials, suppliers do not pass on SC requirements to their own subcontractor level, or changes to SCs are implemented without formal approval. Material disposition is also affected: anyone who disposes of residual stock based on the drawing revision at end of run (EOR) or without checking currency risks delivery of parts with an outdated SC status.

Contractual and organisational controls

Effective controls include the obligation to confirm drawing revision and SC list in the order confirmation, a documented validity period for quotations, and cross-references to verified specifications in tender management. Quality agreements should define obligations to react to deviations, notification obligations for process changes and rights in the event of non-conformity. In the case of serious breaches, a step-in right or a right to switch to a second source is often agreed in practice.

Inspection and goods receipt

In goods receipt, SC-bearing parts must be handled using a dedicated inspection instruction and calibrated inspection equipment. In practice, reinforced incoming inspection is often agreed during the ramp-up phase, which is reduced after statistically justified stability. Responsibility, claims for damages and the handling of clarification processes should be clearly regulated contractually; tax and legal detail questions must be examined professionally on a case-by-case basis.

Current developments: digitalisation and new regulations

SC management is increasingly shifting from paper to data systems. At the same time, regulatory requirements for product and operational safety are increasing the pressure to provide evidence along the entire supply chain.

Digital characteristic chains

PLM and ERP systems increasingly take over the automatic transfer of SC characteristics into bills of materials, purchase requisitions and purchase orders. The aim is a seamless characteristic chain from the drawing object to the inspection report. Interfaces to supplier portals enable, in practice, electronic confirmation of SC relevance and the direct transfer of measured values. Binding inspection specifications can thus be more easily mapped in an approval workflow.

Regulatory pressure to provide evidence

Industries such as automotive, medical technology and aerospace increasingly demand seamless documentation down to the Tier-2 level. Topics such as traceability of the raw material batch, compliance with defined process parameters and verifiability of inspection results are coming into focus. Buyers should therefore examine not only direct suppliers but the entire supply chain with regard to SC responsibility – this also aligns with a Category Charter that standardises requirements per commodity group.

Typical metrics

Complaint rate with SC relevance: typically < 5 % of all complaints

Proportion of complaints relating to a Special Characteristic

Process capability Cpk (SC): ≥ 1.33 (for safety-related characteristics frequently ≥ 1.67)

customary benchmark from automotive methodologies

Completeness of SC documentation for new parts: > 95 %

Proportion of fully communicated SC information in RFQs and purchase orders

First Pass Yield on SC characteristics: > 98 %

Proportion of series parts without rework on critical characteristics

Practical example

A mid-sized mechanical engineering company manufactures hydraulic valve blocks for mobile working machinery. A sealing surface dimension on a valve seat was classified as a Significant Characteristic, as deviations can lead to leakage and therefore to machine failures at the end customer. In the past, the characteristic was only marked in the drawing but not explicitly communicated in RFQs and purchase orders. After several complaints and an increased complaint rate across the affected supplier base, Procurement overhauled its SC management.

- The SC list and the associated inspection instruction were mandatorily referenced as an annex in every RFQ package and order document.
- The order confirmation process was extended to include the supplier's explicit confirmation of the drawing revision and SC relevance.
- The quality agreement specified Cpk requirements, notification obligations in the event of process changes and a documented reaction plan in the event of limit value violations.
- For the ramp-up phase, reinforced incoming inspection was agreed, followed by gradual reduction.

Conclusion

Special Characteristics are not a purely quality-related topic but a procurement-relevant core element of supply security. Controlling them requires a seamless characteristic chain from the specification via the

RFQ and order through to goods receipt. Buyers who communicate SC requirements in a structured manner, anchor them contractually and monitor them measurably sustainably reduce complaints, containment measures and liability risks. At the same time, they benefit in supplier selection, because the ability to control SCs is a meaningful indicator of competence. Those who work systematically here strengthen both their supply security and their own negotiating position.

Frequently asked questions

What are Special Characteristics in simple terms?

Special Characteristics are particularly important product or process characteristics whose deviation can lead to hazards to persons, legal violations or failure of the product function. They are usually marked with a symbol in drawings, bills of materials and data systems. In procurement, they must be communicated to suppliers on a binding basis and monitored.

What is the difference between Critical and Significant Characteristics?

Critical Characteristics typically relate to safety and legal compliance, while Significant Characteristics primarily relate to the function of the product. The classification is based on customer requirements and internal rules, for example according to VDA methodology. The consequences of deviation differ: for Critical Characteristics, the requirements for evidence, inspection and reaction time are usually stricter.

Which standards govern Special Characteristics?

Key references are IATF 16949 for quality management in the automotive supply chain as well as VDA publications on special and safety-related characteristics. In addition, AIAG in the USA defines supplementary methodologies. Industry- and customer-specific requirements, for example from the aerospace or medical technology sectors, must also be taken into account and reviewed on a case-by-case basis.

Who is responsible for Special Characteristics?

The definition of the characteristic lies primarily with Engineering or the design owner. Communicating it to the supplier, embedding it contractually and monitoring it in operation are joint tasks of Procurement and Quality. In practice, shared responsibility has proven effective, as all three areas contribute to controlling these characteristics.

How are Special Characteristics communicated to suppliers?

Through unambiguous marking in the drawing and bill of materials, explicit mention in the request for quotation and purchase order, and reference to valid drawing revisions. The supplier typically confirms SC relevance and the expected evidence in the order confirmation or as part of a PPAP process. Changes to SCs should only be made through formal change requests with renewed approval.

What does SC mean in the supply chain?

In the context of the supply chain, SC responsibility means that subcontractors of the direct supplier must also know and control the requirements for Special Characteristics. The buyer should safeguard this contractually through obligations to pass on requirements and evidence requirements. In practice, suppliers are graded into supplier assessments and SC audits, participating in or subject to them accordingly.