

# Material master attribute maintenance: data quality as the foundation of technical procurement

Attribute maintenance in the material master refers to the systematic maintenance and updating of the properties (attributes) of materials, components and services in the master data of an ERP or e-procurement system. It covers both the initial creation and the continuous updating of technical, commercial and logistical characteristics. Since the material master forms the central data basis for procurement, MRP and production, data quality has a direct impact on procurement objectives, lead times and error costs.

## Key facts

- The material master is the central data source for the ordering process, MRP, pricing systems and compliance checks.
- In practice, material masters often suffer from duplicates, missing mandatory fields and inconsistent naming.
- A clearly defined allocation of field ownership between procurement, engineering and IT is a prerequisite for consistently high data quality.
- Properly maintained attributes typically significantly reduce queries, returns and misorders in the ordering process.
- Classification systems such as eCl@ss or UNSPSC create a uniform vocabulary across systems and suppliers.
- Attribute maintenance should be organised as an ongoing process with KPIs and periodic audits, not as a one-off project.

## Definition: material master attribute maintenance

Attribute maintenance means the structured capture, updating and quality assurance of all characteristic fields of a material within the master data environment. In addition to the material number, the material master includes attributes such as description, commodity group, dimensions, materials, standards, units of measure, supplier references, purchasing and sales data as well as logistics and planning parameters.

### Technical, commercial and logistical attributes

Technical attributes describe the product itself: material type, dimensions, tolerances, standard references or drawing index. Commercial attributes cover pricing, ordering method, currency and supplier assignment. Logistical attributes such as storage location, MRP-relevant parameters, procurement type (external manufacturing or in-house production depth) and packaging and container types control materials planning. All three categories must be maintained consistently, as errors in one domain frequently trigger knock-on effects in the others.

- Technical: material type, standards, drawing number, tolerance class
- Commercial: purchasing organisation, pricing, order text, currency
- Logistical: MRP parameters, storage location, packaging, container types

### **Distinction from general master data maintenance**

Attribute maintenance is a subdomain of general master data maintenance. While general maintenance also covers organisational data such as cost centres or the supplier master, it focuses on the material level. In practice it becomes clear: a clean supplier master is of little use if the material attributes do not match it – for example, where units of measure differ or supplier part numbers are missing. Both data areas must be aligned with each other.

## **Methods and approach to attribute maintenance**

Successful attribute maintenance follows a defined process: from the creation of new materials through maintenance during use to archiving. Central elements are uniform naming rules, classification according to recognised standards and an approval workflow that catches errors early.

### **Classification and standardisation models**

Across industries, classification systems such as eCl@ss, UNSPSC or company-specific commodity group schemes have become established. They provide uniform characteristic catalogues and facilitate searching, the bundling of demand in commodity group management and supply market competitive analysis. In practice, a multi-level class hierarchy with mandatory-attributed leaf classes has proven effective, which also serves as a search filter for supplier acquisition and supplier shortlists.

### **Workflow and role allocation**

Every attribute needs a defined owner. A typical allocation is as follows: the requisitioner or designer provides technical characteristics, procurement maintains commercial fields, logistics handles MRP and warehouse attributes, and IT operates the data model and tools. A central master data pool with approval levels (e.g. creation – review – release) prevents immature records from entering production systems.

### **Tools: from Excel to e-procurement**

Smaller companies often maintain attributes in spreadsheets or directly in the ERP; medium-sized and large organisations increasingly rely on specialised master data management systems, PIM solutions or integrated e-procurement platforms. These offer duplicate checks, validation rules, mass maintenance and interfaces to supplier catalogues. Alignment with specification management is important so that technical documents and master data remain consistent.

## **Key KPIs of material master quality**

Data quality can be measured – and should be measured in order to weigh maintenance effort against benefit. The following KPIs have proven effective as steering metrics in practice.

### **Completeness and quality rates**

Attribute completeness indicates how many mandatory fields are filled per material. Values above 95 per cent for critical fields are often targeted. The duplication rate shows how often identical materials have been created multiple times; in unmaintained masters, typically 5 to 15 per cent of records exist as

duplicates. The error rate in the ordering process – for example due to incorrect units of measure or outdated supplier references – is a direct indicator of failure.

### **Process and lead times**

Time metrics are also relevant: the processing time for creating a new material in practice frequently ranges from a few hours to several days and should be measured. The purchase requisition to purchase order lead time (requisition to PO) deteriorates noticeably when master data is missing or has to be queried. As-of-date currency – i.e. the proportion of records reviewed within the last twelve months – provides information on the freshness of the inventory.

## **Risks and controls in attribute maintenance**

Poorly maintained master data causes concrete costs: misorders, duplicate purchasing, incorrect materials planning, limited analytical capability and compliance risks. These can be countered with organisational and technical controls.

### **Typical risk fields**

Duplicates lead to duplicate stock and distorted consumption forecasts. Missing or incorrect units of measure (piece vs. metre vs. kg) cause price discrepancies and disruptions in freight audit and invoice verification. Outdated supplier assignments block comparisons and secondary sourcing above a second-source threshold. Incomplete technical attributes make the suitability assessment of alternative materials and the second-life use of used components more difficult.

### **Control mechanisms and governance**

Proven controls include mandatory field validation, duplicate checks at creation, periodic sample audits (typically quarterly) and a change log with four-eyes approval. For safety-related or standard-relevant attributes, a binding check within the serial approval process is recommended. In contracts, contractual obligations to supply data should be defined with suppliers over the contract term; changes to the scope of supply are documented and made good via an amendment.

## **Current developments and outlook**

Attribute maintenance is increasingly shifting from manual clerical work to semi-automated, AI-supported processes. At the same time, regulatory and sustainability-related information requirements for materials are rising.

### **Automation and AI support**

Classification suggestions via language models, automatic duplicate detection and enriching attributes from data sheets or supplier catalogues noticeably reduce manual effort. Exchange rate fixing and price dashboards benefit from consistent currency and unit fields. Nevertheless, human review remains indispensable for safety-relevant characteristics – automation accelerates maintenance but does not replace expert assessment.

### **Sustainability, compliance and supply chain**

Increasingly, attributes for origin, CO footprint, recycled content and declarations of conformity are required – for example, for due diligence obligations along the supply chain. Those who integrate these fields into the data model early can base risk management processes directly on master data and

generate reports for customers and authorities without additional effort. Advance payment eligibility or Incoterms such as CPT can also be mapped as attributes and taken into account in procurement decisions.

## Typical metrics

### **Attribute completeness: > 95%**

Proportion of mandatory fields filled per material; A-parts should reach close to 100%

### **Duplication rate: < 2%**

Proportion of duplicates in the active inventory; unmaintained masters typically stand at 5–15%

### **Processing time for new material creation: < 2 working days**

From creation request to release; strongly dependent on workflow and approval levels

### **Error rate in the ordering process: < 1%**

Proportion of orders requiring corrections due to master data, e.g. incorrect units of measure

### **As-of-date currency: > 80%**

Proportion of material records reviewed within the last twelve months

## Practical example

A medium-sized mechanical engineering company with around 60,000 active materials discovered during a price comparison exercise that identical wear parts were managed under three material numbers. The consequences: duplicate stock, fragmented purchasing volumes and a weakened negotiating position for the next round of negotiations. The company subsequently established a central master data management function with clear field ownership and periodic audits.

- De-duplication followed by consolidation of stock levels and order histories
- Introduction of a classification-based naming scheme based on eCI@ss
- Mandatory attribute catalogue for new materials with four-eyes approval
- Quarterly sample audits with reporting of quality KPIs to procurement management

## Conclusion

Attribute maintenance in the material master is not merely an IT issue but a key strategic procurement task. Properly maintained attributes reduce error costs, improve the meaningfulness of analyses and create the data basis for automation, compliance and sustainability reporting. Clear responsibilities, a binding creation and change process and regular quality measurement are crucial. Companies that establish this also accelerate processes from enquiry to purchase order and gain negotiating leverage. The investment typically pays for itself through saved search and correction work as well as better procurement decisions.

## Frequently asked questions

### **What is included in the material master?**

The material master includes the material number, descriptions, classification, technical characteristics such as material type and dimensions, units of measure, commodity group, purchasing and sales data, MRP and warehouse parameters as well as supplier references. Which fields are actually maintained depends on the industry and the ERP system. What matters is that all characteristics relevant to

procurement, production and compliance are complete and up to date.

### **Who is responsible for maintaining the material master?**

In practice, responsibility is shared among several roles: engineering or design provides the technical attributes, procurement maintains the commercial fields, logistics the MRP data, and IT operates the data model and tools. A central master data pool with clearly defined owners per attribute has proven effective. Without this clarification of roles, gaps and inconsistencies typically arise.

### **How often should the material master be maintained?**

New records are created continuously in day-to-day operations. Existing records should be reviewed on a risk-based basis: critical A-parts more frequently, C-parts less frequently. Quarterly sample audits and an annual full check of selected mandatory fields have proven effective in practice. Crucially, there must be a change process that triggers updates immediately when events occur, such as a supplier change or a standard revision.

### **What role does classification such as eCl@ss play?**

Classification systems provide a uniform vocabulary and characteristic catalogues across systems, sites and suppliers. They enable rapid material searches, the bundling of requirements and comparison with the supply market. Without uniform classification, duplicates often remain undetected because identical parts have been named differently. For technical procurement, eCl@ss is the most widely used standard in the DACH region.

### **What does a material master clean-up cost?**

This depends on data volume, condition and methodology. With purely manual maintenance, practice typically shows 15 to 45 minutes per material record; automated pre-cleansing using classification and de-duplication tools significantly reduces this effort. Users should also factor in downstream costs: faulty master data continuously causes queries, misorders and duplicate stock levels, which usually exceed the cleansing effort quickly.

### **How are the material master and e-procurement related?**

E-procurement systems, catalogues and ordering platforms work exclusively with the master data from the ERP. If attributes are incomplete or inconsistent, this leads to incorrect orders, rejected invoices and manual rework. Clean attribute maintenance is therefore a fundamental prerequisite for functioning digital ordering processes and for the automated three-way match between purchase order, goods receipt and invoice.