

Dangerous Goods Management: Systematically Controlling Hazardous Goods in Procurement and the Supply Chain

Dangerous goods management refers to the systematic planning, control and monitoring of all processes relating to the procurement, transport, storage and disposal of hazardous goods. It combines regulatory obligations with operational procurement processes and ensures compliant sourcing. For buyers and supply chain managers in industry, it is an essential component of supplier and risk management.

Key facts

- Dangerous goods management covers classification, labelling, packaging, transport, storage and documentation of hazardous goods along the entire supply chain.
- In Germany, alongside ADR (road transport) and RID (rail transport), the GGBefG and the GefStoffV apply; obligations are shared between consignor, carrier and consignee.
- Typical core elements in practice are safety data sheets, dangerous goods safety advisers, training records and seamless transport documentation.
- Benchmark: dangerous goods supply processes frequently require 10 to 30 per cent more planning and inspection effort than standard procurement.
- Key performance indicators include freight rate error rate, training rate of involved employees and lead time deviations in dangerous goods transports.
- Digital solutions for document and master data maintenance typically significantly reduce manual inspection effort and lower the risk of violations.

Definition: Dangerous Goods Management

Dangerous goods management is the totality of all organisational, legal and operational measures for the safe and legally compliant handling of hazardous goods in procurement, production and logistics. It ranges from classification and labelling through the selection of appropriate packaging regulations to transport and storage. In a procurement context, it means above all: assessing suppliers for dangerous goods suitability, qualifying transport providers and maintaining seamless documentation.

Distinction: Dangerous Goods versus Hazardous Substances

Dangerous goods concern the transport of hazardous goods, whereas hazardous substances concern workplace and health safety when handling chemical substances. The two regimes interlock: a hazardous substance in the workplace is frequently also dangerous goods in transport. Buyers should examine both perspectives, as a supplier may work correctly in terms of hazardous substance law yet still fail to comply with transport regulations.

Legal Framework at a Glance

Depending on the mode of transport, ADR, RID, the IMDG Code (sea freight) and IATA-DGR (air freight) apply, supplemented by national regulations such as the GGBefG and the GefStoffV. In addition, product safety and occupational health and safety requirements apply. The examination of which regulations are binding in each individual case should be carried out legally and professionally on a case-by-case basis; this glossary article does not constitute legal advice.

Areas of Responsibility in Dangerous Goods Management

Dangerous goods management runs through several phases of procurement: from supplier selection through operational ordering to traceability in the event of an incident. The central areas of responsibility can be grouped into four blocks.

Classification and Master Data Maintenance

Every hazardous good requires a UN number, hazard label, packing group and correct shipping name. This data must be consistently maintained in the master data process – faulty master data is in practice one of the most common causes of delays and complaints. A regular data quality report helps to systematically identify gaps and outdated safety data sheets.

Supplier Selection and Contract Provisions

As early as supplier selection – for example within a competitive analysis of the sourcing market – dangerous goods competence, licences and insurance cover must be examined. In tenders and framework agreements, responsibilities for labelling, documentation and liability should be clearly regulated. Negotiation management gains an additional dimension here, as additional costs for special packaging and qualified freight forwarders must be calculable.

Transport and Logistics

Dangerous goods transports require qualified carriers, suitable route planning and frequently higher transport costs. Volume bundling is also possible: anyone leveraging economies of scale through consolidated groupage shipments must check the quantity of dangerous goods per transport unit against limited quantity thresholds. In the event of bottlenecks, control mechanisms such as changing call-offs or supplier escalation come into play – however, with dangerous goods this must be done in strict compliance with regulations, not by circumventing inspection processes.

Storage and Disposal

At the receiving location, storage regulations (segregation requirements, storage classes, quantity limits) apply, as do waste and disposal obligations for residual materials. Procurement should consciously dimension safety stock strategies for dangerous goods: higher safety stocks increase storage risks and inspection effort. A deviation analysis of inventory and disposal processes reveals the need for action at an early stage.

Methods and Approach in Procurement

A practically viable dangerous goods management system follows a structured process that can be integrated into existing procurement procedures. Essential is the interlinking with supplier risk management – in the sense of supplier de-risking – and with day-to-day operational procurement.

Risk Assessment and Classification of the Range

The first step is an inventory: which procured articles are hazardous goods, in what quantities, on which transport routes? The order history provides a solid data basis. From this, a risk profile is derived for each article group, which determines the depth of inspection obligations.

Supplier Qualification and Auditing

Dangerous goods-relevant suppliers are qualified according to defined criteria: training records of personnel, process descriptions, insurance certificates and emergency concepts. For strategically important sources of supply – for example in single sourcing – an in-depth audit is recommended, as a failure would be difficult to replace. A strategic partnership additionally requires regular joint reviews of dangerous goods processes.

Process Rules in Day-to-Day Operations

In the ordering process, dangerous goods articles must be clearly marked so that order processing, goods receipt and freight forwarder selection apply the special rules. Mechanisms such as stop shipment should be contractually agreed: if the safety data sheet or labelling is missing, the goods are not shipped or accepted. Regarding spot purchase versus framework agreement: spontaneous substitute purchases carry an increased risk of error, as assessment and labelling processes run under time pressure.

Key KPIs in Dangerous Goods Management

Measurement sets priorities: key figures make weak points visible and enable the steering of suppliers and logistics providers. Proven in practice is a combination of compliance, quality and efficiency metrics.

Compliance and Quality Metrics

Key figures are the rate of complete dangerous goods shipments (documents, labelling, packaging correct), the training rate of involved internal employees and the number of reported incidents per transport volume. In addition, a deviation analysis against transport specifications provides indications of systematic sources of error with particular suppliers or freight forwarders.

Efficiency and Process Metrics

Also relevant are lead time deviations in dangerous goods transports, the proportion of safety data sheets delivered on time and document completeness in the master data process. Exception management also benefits: anyone who learns about exceptions and special cases in a structured manner can resolve recurring problems through process improvements. Lessons learned from incidents and near misses should be documented and fed back into training.

Risks and Controls

Dangerous goods entail considerable safety, financial and reputational risks. Inadequate handling can lead to personal injury, fines, liability claims and supply failures – in individual cases with criminal consequences for responsible persons.

Typical Risk Areas

Common weak points are incomplete or outdated safety data sheets, incorrect classification by suppliers, poorly trained personnel in freight forwarding and goods receipt, and exceeding limited

quantity thresholds in consolidated shipments. Cascading effects also threaten: a rejected dangerous goods transport can shut down an entire production line.

Control Mechanisms and Escalation Routes

Effective controls include incoming inspections per shipment, documented releases, regular supplier audits and clear supplier escalation in the event of violations. Dangerous goods safety advisers should be positioned with sufficient organisational independence to stop shipments even when this is commercially unwelcome. A documented stop-shipment process with defined decision-making authority protects against spontaneous, non-compliant shortcuts.

Current Developments and Digitalisation

Dangerous goods management is increasingly being digitalised: electronic safety data sheet management, automated classification software and integrated transport management systems reduce manual effort and sources of error. At the same time, regulatory tightening and rising demands from customers increase the requirement for seamless evidence.

Digital Document and Data Processes

Central platforms for safety data sheets, automatic reminders of expiry dates and interfaces to ERP master data maintenance are widespread in practice. A high degree of automation in invoice and ordering processes provides additional relief, as dangerous goods data is transmitted in a structured rather than manual manner. Consistently maintained master data remains a prerequisite – technology does not replace data quality.

Regulatory and Market Trends

Harmonisation efforts in the EU, stricter controls in road freight transport and increased traceability requirements from customers are increasing documentation pressure. At the same time, qualified dangerous goods transports are becoming more expensive; buyers should factor this into the procurement price escalation rate and make it visible as a separate cost element in price negotiations. Payment terms such as the early payment discount process can also be combined, provided the dangerous goods inspection processes do not suffer from accelerated handling.

Typical metrics

Dangerous Goods Compliance Rate: > 98 %

Proportion of shipment-compliant dangerous goods deliveries (documents, labelling, packaging)

Dangerous Goods Training Rate: 100 %

Proportion of trained employees in affected functions, to be evidenced annually

Dangerous Goods Lead Time Deviation: < 5 %

Proportion of delayed dangerous goods transports relative to total transport volume

Document Completeness: > 95 %

Proportion of articles with a current, complete safety data sheet

Practical Example

A medium-sized mechanical engineering company sourced paints and cleaning agents from several

European suppliers. Transports were repeatedly rejected because labelling or shipping documents were incorrect – resulting in consequential costs and production delays. The company subsequently introduced a structured dangerous goods management system.

- Complete classification of all dangerous goods articles and streamlining of the master data process, accompanied by a monthly data quality report
- Supplier qualification with defined dangerous goods criteria and an agreed stop shipment in the event of missing documentation
- Bundling of transports with two freight forwarders with proven dangerous goods competence, reducing transport costs and sources of error
- Quarterly lessons-learned rounds between procurement, logistics and HSE with documented adjustments to inspection processes

Conclusion

In industrial procurement, dangerous goods management is not a peripheral topic but a compliance and risk topic with a direct impact on costs, delivery reliability and liability. Those who systematically control classification, supplier qualification and transport processes avoid costly special cases and failures. Clean master data, clearly regulated responsibilities and measurable controls are decisive. Digital tools significantly support implementation but do not replace professional review. Buyers are well advised to anchor dangerous goods aspects early in tenders, contracts and supplier evaluations.

Frequently asked questions

What does dangerous goods management involve?

These include classification and labelling of the goods, packaging in accordance with applicable regulations, selection of qualified transport providers, seamless documentation as well as storage and disposal. In addition, there is training of the persons involved, appointment of dangerous goods safety advisers and regular checks of suppliers and freight forwarders.

Which regulations apply to dangerous goods transport in Germany and the EU?

Depending on the mode of transport, ADR (road), RID (rail), the IMDG Code (sea) and the IATA-DGR (air) apply, supplemented by national law such as the GGBefG (German Dangerous Goods Transport Act) and occupational health and safety regulations such as the GefStoffV (German Hazardous Substances Ordinance). Which regulations are binding in each individual case depends on the substance, quantity and transport route and should be assessed professionally.

When must a company appoint a dangerous goods safety adviser?

In principle, when dangerous goods are transported, packed, dispatched or received and this does not only happen occasionally on a small scale; the exact thresholds are governed by the applicable regulations. The appointment must be reported to management. If in doubt, the extent of transport activities should be reviewed professionally or legally.

What costs does dangerous goods cause in procurement?

Typically, additional costs arise for special packaging, qualified freight forwarders, insurance, training and documentation. In practice, transport costs for dangerous goods are often noticeably higher than for standard goods. Buyers should take these costs into account as a separate cost element in calculations and price negotiations.

What should a buyer do in the event of a supplier's dangerous goods violations?

First, the shipment should be stopped – ideally contractually agreed as a stop shipment. This is followed by a documented complaint, a deadline and, in the event of repetition, a structured supplier escalation up to a requalification audit. Every incident should be incorporated into a lessons-learned documentation.

How can digitalisation improve dangerous goods management?

Digital safety data sheet management, automated classification and integrated transport management systems reduce manual errors and enable seamless evidence. Maintaining master data remains important, as software cannot correct faulty input data. Regular data quality reports ensure the effectiveness of digitalised processes.