



Technical Conditions of Order and Deliveries

Quality Requirements

Edition 01/2012

Preface

Outstanding quality as a commitment for maximum customer value

The Technical Conditions of Orders and Deliveries (TCOD) describe the general quality requirements of ASM Assembly Systems, which is hereinafter referred to as "ASM AS", for products and processes of its suppliers and subcontractors.

ASM AS is a leading provider in all important segments of the electronics manufacturing industry. With our SIPLACE placement machines, we are setting the standards for SMT process automation across the globe.

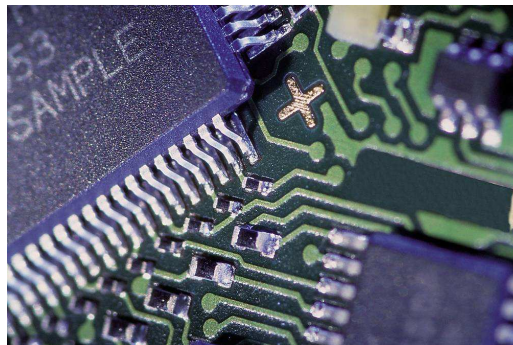
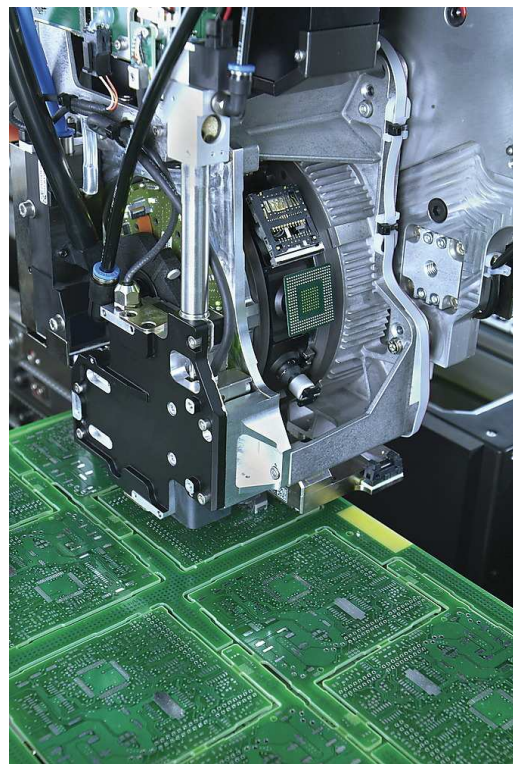
Success in a hard-fought market can only be achieved with products that fully meet our customer's expectations with respect to innovation, performance, quality and price.

This commitment is possible only through the integration of high-performance and quality-focused suppliers as partners into the overall concept.

Together with us, vendors are the locomotives for quality, technology, logistics and productivity. Working from this base, we intend to improve our processes, services and structures continuously so we can satisfy the requirements of a highly innovative and dynamic marketplace.

In this TCOD, the term "supplier" designates the contractors of ASM AS. Contractors of suppliers to ASM AS are designated as "subcontractors".

The requirements defined in the TCOD apply to suppliers, based on the expectation that these will make a partnership contribution to our common goal to provide outstanding quality for maximum customer value at competitive prices.



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1 Scope of Application

The Technical Conditions of Orders and Deliveries (TCOD) apply to all products delivered to ASM AS. They represent the minimum requirement, which is complemented with specifications relating to specific products and processes as required.

Products include all assemblies, parts, systems and services that are delivered by a supplier.

The procedures and definitions described below are standard at ASM AS. ASM AS expects of its suppliers comparable procedures in their processes used to protect the quality of their performance.

The supplier assumes the basic responsibility for the quality of the supplied products. This applies to the entire scope of supply.

Where the supplier acts as a general contractor, ASM AS expects its suppliers to enter into a binding agreement with their own suppliers governing the quality requirements defined in this TCOD. If requested by ASM AS, the supplier is required to name any subcontractors involved.

It is assumed that the supplier possesses suitable expertise to verify that "third-party" technologies meet the quality requirements.

The TCOD replaces and supersedes all previous editions. It is effective until it is revoked or replaced with a new edition.

The TCOD complements the ordering conditions of ASM AS. The ordering conditions are also agreed and will take precedence.

2 Contact

The central point of contact for all aspects of the supplier is the Purchasing department of ASM AS. The Purchasing Department will name a designated contact for suppliers.

Binding contracts and orders will become effective only if processed via the strategic or operative Purchasing / Planning & Scheduling department of ASM AS.

ASM AS expects that each of its suppliers names a central contact that is responsible for the supply relationship.

3 Quality Management / Environmental Management

3.1 Quality management system

ASM AS assumes that its suppliers have a process-related quality management system according the requirements of DIN EN ISO 9001:200x or FD ISO/TS 16949 in place, also do lasting use of this system.

3.2 Environmental management system

ASM AS is committed to the protection of the environment.

We therefore expect of our suppliers that they observe the requirements of ISO 14001 with respect to environmental management in the plant.

3.3 Quality target

The supply contract commits the supplier to supplying products ordered by ASM AS free from defects.

The supplier shall ensure, through preventive measures and the application of suitable methods (e.g. FMEA, FTA, QFD, review techniques) and suitable tests in the processes that all defined quality requirements are fully met.

To maintain long-term competitiveness, the supplier shall establish, among other things, the CIP philosophy (**C**ontinuous **I**mprovement **P**rocess) in his company and ensure active participation in this process.

All supplies to ASM AS are subject to the quality goal of

“Zero Defects”

The suppliers shall furnish evidence of the suitability of their processes used in series production by means of scorecard systems and/or statistical process control systems.

The following target values apply:	cp/cpk	1.33
	FPY	98%

Product-related quality objectives that go beyond this are defined in the product specifications

4 Selection, approval and release of suppliers

ASM AS base its selection of suppliers on the criteria of quality, technology, logistics, price and productivity.

During the selection process, supplies must prove that they are capable of supplying their products in order to meet all requirements of the specifications, drawings and order conditions of ASM AS.

ASM AS will usually evaluate a supplier's capability to provide quality prior to the start of a supplier relationship. The method to determine this capability can be a combination of supplier declaration, a visit, a system audit, a process audit and the evaluation of product samples.

The positive evaluation of the above criteria will usually result in the placement of an order including a first article inspection.

The successful first article inspection and the proven stable quality of the series production will result in the release (acceptance) of the supplier.

5 Order Processing / Change Management

5.1 Orders

Central contact person for all interests of the supplier is the purchase department of ASM AS.

Orders are exclusively placed via the Strategic Purchasing or the Operative Purchasing / Planning & Scheduling departments.

ASM AS is not obliged to accept any service provided prior to the effective conclusion of a contract.

For any placed order, the supplier shall verify the documents enclosed with the order with respect to plausibility, completeness and feasibility (technically and deadline-related). The supplier shall verify the documents made available to him with respect to the mentioned and other applicable guidelines, standards and legal provisions and discuss any discrepancies with ASM AS. The supplier shall confirm the contents of the order verification to ASM AS by way of order confirmation.

In case of any discrepancies or changes or in case of expected delays, the supplier shall inform ASM AS in writing and initiate adequate measures to solve the problem.

5.2 Order basis

As a rule, an order is based on released documents. These documents are part of the order and are enclosed in full at least with every initial or First article order.

The supplied technical documents shall always be verified for their completeness and current status.

Being of subsequent rank to the defined requirements in the concluded contracts and quality agreements, the requirements from these "Technical Conditions of Orders and Deliveries" shall apply.

5.3 Inquiries

Inquiries to suppliers must at least include the following information:

- Technical description of product or description of service
- Basic framework conditions and information about the application or use of the requested product / service
- Applicable additional standards and guidelines
- Specifications and datasheets, information about the manufacturer if required

The requirements set forth in this TCOD shall be observed when processing these inquiries.

5.4 Product changes

ASM AS may only introduce technical changes for series parts/components with the supplier on the basis of written change notices. The scope of the change and the interface at which it takes effect must be unambiguously defined. At ASM AS, this is done using an external change notice issued by the relevant purchasing or logistics department.

5.4.1 Product changes at supplier side

The designs, reliability requirements and manufacturing processes agreed and defined in the order documentation may not be changed without the written approval of ASM AS; failure to comply with this provision could result in unexpected severe and expensive consequences for the finished product.

The supplier shall notify the purchasing and quality assurance departments for supplied parts at ASM AS of any planned change to products and manufacturing processes as far as these have an impact on form and appearance, interchangeability or functionality and attributes.

The supplier shall identify and document the changes and subject them to a test that is adequate for the changes. In this context, it shall verify all requirements with respect to functionality, compatibility and interchangeability with existing products.

The suppliers must maintain an adequate version management system for their own products.

5.4.2 Product Discontinuation / Product Cessation by the Supplier

If it is the supplier's intention to stop producing and delivering an approved product, Strategic Procurement (ASM AS GP) must be informed of this in a timely fashion.

To this end the supplier must furnish the following information to Strategic Procurement no later than 6 months before discontinuation of production:

- ASM material number of the module discontinued and disposed of
- Residual amount that could still be delivered
- Last delivery deadline or deadline for "Last Call"
- Possibilities for substitute coverage
- Suggestions for substitutes including assessment of the risks if supplier uses an alternative product

The supplier is obligated to deliver the ordered residual coverage such that this will withstand a specified storage period without detrimentally affecting the product and processing properties. The buyer is to be informed of the relevant storage conditions (e.g., climatic).

5.5 Property of ASM AS – production tools

The conditions will be laid down contractually when tools are ordered.

Independent from this condition, tools ordered and paid from ASM AS, has to be marked as property of the ASM AS (Material number, property ASM AS).

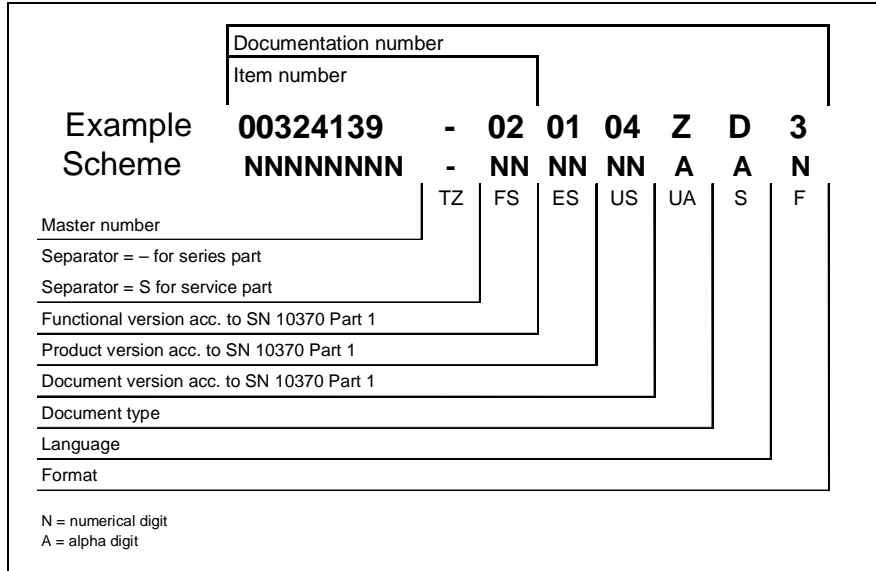
6 Technical Documentation

6.1 Bill of materials as master document

The bill of materials, which is to be considered the master document, specifies all corresponding subassemblies, individual parts and specific documents defining the ordered product. The supplier shall verify against this bill of materials whether all relevant documents are available in their current version for the execution of the order.




6.2 Technical numbering system

The identification of the ASM AS products is described below. Any change of a master number (= part number) or a functional version (FS) or product version (ES), which can also be referred to as a revision (RV), can affect the manufacturing of the products. All employees of the supplier who are involved in parts, assemblies and systems to be supplied to ASM AS must be familiar with the numbering system.



6.3 Test symbols used in technical documentation

In the technical documentation of ASM AS, individual product attributes are identified with symbols. Their assignment is shown in the table below.

Identification / Symbol	Attributes	Definition of Attribute
	Safety-relevant attribute	An attribute that is critical for the safety of the products of ASM AS and is of extreme importance. The supplier must furnish the evidence laid down in the test instructions that the specified attributes have been met. In the event that no test instructions are available, the type and scope of testing must be agreed in writing with the customer. The products must display the required attributes 100%. The supplier must perform a manufacturing process FMEA for the required attributes.
	Critical attribute (Test category I)	An attribute that is critical for the functionality of a component and is of special importance for quality, reliability or durability. For series production, the supplier must furnish evidence of the required process capability for these attributes by means of scorecards or SPC evaluations. Goal: Cp/Cpk ≥ 1.33 (For underlying principles, refer to IPC-9191 and the associated references)
	Primary attribute (Test category II)	An attribute that is not critical for the functionality but whose lack would significantly affect the expected performance of a product, reduce customer satisfaction or impair productivity. Such attributes shall be ensured by means of attribute testing (Pass / Fail test). (Sampling test according to DIN ISO 2859 Part 1)
without identification	Secondary attributes (Test category III)	Other attributes not classified as critical attribute or primary attribute. It is the responsibility of the supplier to ensure these attributes.

7 Process Requirements

7.1 Project management

7.1.1 Project planning

During project planning, our suppliers accept responsibility for their entire supply chain, starting at the interface to ASM AS right down to their own suppliers and beyond.

The supplier shall subdivide projects into sections of a defined scope and with defined contents and milestones. It must be ensured that sufficient resources will be used to meet the needs.

The progress of the project must be checked at regular intervals in a manner which can be verified, and reports must be sent to ASM AS.

7.1.2 Quality planning in projects

In addition to the planning of each project step as well as the associated milestones, the supplier shall define, as early as at the time of project start, the systematic and methodical procedure for error prevention and quality protection.

The supplier shall use quality measures such as FMEA, FTA, Design Review, tolerance calculations etc., to assess the risks of the project / product. The defined quality measures must be documented in a quality plan.

The quality plan shall be subjected to reviews in regular intervals conforming to the progress of the project. The results of the individual measures shall be recorded in writing and are an integral part of the project documentation.

The quality planning shall include the product related requirements, legal provisions and standards, amongst others for product safety and environmental protection, and must be documented in a traceable manner.

In the case of development orders, the audits accompanying the development process ensure the compliance with the agreed development steps and degrees of project maturity. The audit will be performed by representatives of ASM AS QM together with the supplier. The time and form of the audit as well as the documents to be presented at the audits will be defined within the context of an agreement between the supplier and ASM AS.

7.2 Hardware and software development

The iterative development process established at ASM AS requires suppliers and system partners to provide a high degree of structured and closely coordinated interaction, particularly for products and services provided specifically for ASM AS. In this process, ASM AS expects the provision of samples and documents for the purpose of application testing in early phases of the development process.

The Requirements Specification and/or other specifications, in which the quality requirements and operating conditions are stipulated, form an important basis for the development work.

The quality requirements to be met by the supplier in a development job will already be defined and described at the beginning of the development phase in the context of a contractual agreement (e.g. order or development contract).

7.3 Documentation

7.3.1 Product documentation

The documents in this category describe the development process for a product up to production.

The product documentation provides information on the underlying conceptions which led to generation of the product. Furthermore, it provides evidence that the proper procedures have been followed during development and that the relevant legislation and guidelines have been observed. ASM expects its suppliers to write and maintain suitable product documentation.

7.3.2 Technical documentation

The technical documentation for systems generally comprises the user manual, service manual, installation manual, software version description and spare parts documentation.

Creation of technical documentation on the part of the supplier is specified in a separate agreement and/or the project or product requirements. The structure, layout and file formats to be supplied form part of the agreement.

7.4 Production

7.4.1 Production planning

To achieve the quality required by ASM AS, the supplier must apply a systematic planning of the manufacturing processes. This is part of the quality management system used by the supplier. Each step in the manufacturing of the product to be supplied must be documented in work and process instructions.

7.4.2 Production and assembly equipment

The use of suitable production and assembly equipment must be planned at an early stage in order to ensure that the equipment is available with sufficient capacity at the start of the series production. The employees must be adequately trained for the application.

Service and maintenance of the equipment must be planned in a preventive manner. Evidence of the systematic and consistent application shall be furnished.

The supplier must establish and maintain an emergency strategy for the processes that could prevent his capability to deliver.

7.4.3 Test planning / test methods / test equipment / statistical methods

The protection of quality with the suppliers must be so reliable that an adequate control of the manufacturing processes (process capability) is achieved to meet the agreed requirements.

The extent of testing during the manufacturing process shall be planned and defined according to the degree of the achievable and achieved process capability, the respective quality attribute and the possible impact of faults.

The tests shall be documented so that the supplier can prove at any time that the specified requirements were met over the entire manufacturing period.

The application of statistical methods (e.g. SPC, MFU) serves the evaluation and proof of the quality capability of relevant process and product attributes. They enable the user to detect changes in the process faster and to correct the impacts on the customer's product at an earlier stage.

For further details on process capability and SPC, see IPC-9191.

Process FMEA:

To ensure that the manufacturing process is free of errors, ASM AS expects its suppliers to perform a process FMEA. This is designed to detect sources of error and to enable preventive measures to be taken to avoid errors.

Testing equipment:

The testing equipment used must be sufficiently accurate in respect of the specified tolerances. The measurement uncertainty of the measuring equipment used must be taken into account. The supplier must ensure that the measuring equipment used for quality assurance is inspected and calibrated at specified intervals.

Analyses of the measurement systems must be used to ensure that the measuring equipment and devices used are capable of providing meaningful measurements in the context of statistical process regulation and process capability analyses. Any deviations and uncertainties in the measurement system that arise must be appropriate in relation to the threshold values and to process variance.

The supplier must ensure that any variance that does arise during series measurements cannot be traced back to any lack of accuracy or precision on the part of the measuring system.

For further information, see Measurement System Analysis (MSA) Reference Guide QS 9000.

7.4.4 Execution of Tests

Tests during production permit the early detection of faults as well as selective countermeasures. This helps prevent negative impacts on the capability to deliver and reduce or avoid rejects and rework costs.

Purchased parts must be subjected to quality testing before use.

In-production tests shall be implemented for quality-relevant manufacturing steps.

In order to supply fault-free products in the sense of the "zero defects" quality goal, ASM AS considers it indispensable to conduct a final test unless the quality requirements have already been adequately protected in the previous processes.

Functional modules must be subjected to a 100% functional test. The results shall be recorded as a "First Pass Yield" report.

The rework / repairs performed on failed assemblies shall be recorded and evaluated by fault attributes.

The contents of the tests shall be defined in test instructions. These test instructions must define the test methods, test features, test equipment, test markings and the documentation of test results.

7.4.5 Test records and safekeeping

Quality records furnish the evidence that the quality requirements have been met. They must be maintained so that they can be evaluated and permit a clear assignment to the tested products.

The quality records must be kept in compliance with the applicable legal provisions. The responsibility for the proper safekeeping lies with the supplier.

The records shall be made available for review to the representatives of ASM AS on request and serve as the basis for cyclic quality reviews between the supplier and ASM AS.

7.4.6 First article inspections

The First article inspection must furnish evidence prior to the start of the series production that the quality requirements that have been agreed and defined in drawings and specifications are met.

First articles are products that have been fully produced using series equipment under series conditions.

A sufficient number of First articles shall always be produced to enable an initial statistical assessment of the manufacturing process. The selection criteria for the statistical analysis shall be coordinated with the Incoming Inspection department of ASM AS. At least 3 units shall be subjected to 100% testing of all attributes.

The number of First articles to be manufactured shall be specified by ASM AS in the order for the First articles.

This procedure serves the purpose of obtaining an initial statement about whether the production process is repeatable, stable and capable with respect to the accuracy requirements.

A First article inspection must always be conducted for / in the case of:

- Parts / assemblies (new parts) manufactured by a supplier for the first time
- Major changes initiated by EA according to the requirements defined in the change requests
- Product changes initiated by the supplier or his subcontractors if such changes have an impact on the form and appearance, interchangeability or functionality as well as performance features
- Production relocations initiated by the supplier or his subcontractors with respect to function-relevant / critical processes
- Changes of the production process at the supplier or his subcontractors with respect to function-relevant / critical processes

In the case of production relocations and changes of production processes with respect to function-relevant or critical processes, the supplier shall always notify ASM AS in order to coordinate the implementation and number of First articles to be supplied.

As a rule, the order to produce First articles will be defined by ASM AS in the order or change request.

Inspection of the First articles according to the quality attributes that are defined in the drawings and specifications with respect to dimensions, materials, functionality, appearance, surface quality, etc. in the form of a variable test (measuring inspection) if possible. This may require the use of external services.

As a rule, the goal shall be process capabilities in the individual processes. The measuring and test results have to be evaluated under this aspect.

Scope of First article inspections:

- First article inspection report results
- Documentation of test results using the forms provided for this purpose
Test results shall be recorded as set point (lower and upper) tolerance limits and actual value, in order to enable their quick and easy comparison.
- Report results and test results shall be enclosed with the supplied goods so that they can be clearly assigned to the numbered parts and are provided with the date / signature.
- Reports on life cycle, reliability or other special tests
- Clearly identified parts that can be clearly assigned to the documentation
- Evidence of compliance with required legal provisions (e.g. environment, safety)
- Declaration of compliance with the specified requirements for purchased parts / components used
- Drawings showing the marked test characteristics (assignable to test result, e.g. by consecutive number)

The documentation can also be supplied by fax, email, Internet etc. in coordination with ASM AS.

Incomplete deliveries of First articles will result in the refusal of the First articles!

As a rule, all quality requirements must be met. Non-compliance is not permissible!

Repeated refusals can lead to objections, which can in turn affect the supplier rating!

After the samples have been submitted and the First article inspection reports have been generated, the Incoming Inspection department of ASM AS will conduct a counter-check. It is also possible to conduct a joint inspection at the supplier after prior coordination.

The release of the samples does not dispense the supplier from his responsibility for the quality of his products.

The release of the First articles does not constitute a delivery order.

Approved First article forms include e.g. VDA forms, see Appendix 11.1

7.5 Identification and traceability, configuration documentation

Special attention must be paid to safety-relevant components and assemblies for reasons of product liability.

Failure to observe the minimum applicable regulations in the respective countries may entail severe pecuniary penalties, recall or replacement campaigns or a sales ban in the case of quality defects.

In the event of a product safety incident, evidence of the properly executed tests and the traceability of the results must be furnished for the affected components and assemblies.

In order to ensure the traceability of the supplied products, the supplier must clearly identify his supplied or manufactured products relevant for the safety or functionality of the ASM AS products.

Where required by ASM AS, traceable documentation must be provided for systems and assemblies with respect to their constituent components and subassemblies by means of serial numbers or batch numbers. The records must be kept in compliance with the applicable legal regulations.

Form and content of the identification and documentation shall be agreed with ASM AS if not already specified in the product documentation.

7.6 Supply to ASM AS

Supply deliveries must be provided with adequate identifications to allow their clear assignment to the associated delivery documents. The delivery documents must contain information about the delivered material with the associated material numbers and orders for which the delivery is made.

Labeling of packing units see chapter 9.6.5

7.7 Quality Defects

7.7.1 Defective products at ASM AS

If deviations from the agreed specifications and requirements are detected during the tests or during the manufacturing at ASM AS, the following measures may become necessary in coordination with the supplier, in addition to any claims and rights of ASM AS constituted according to the order conditions in connection with the applicable legal provisions:

- Refusal of the delivered lot by ASM AS
- Immediate replacement delivery by the supplier for defective and suspect parts
- 100% inventory classification by the supplier
- Rework on site by the supplier
- Rework on site by ASM AS.

7.7.2 Notification of defects and statements

Every refusal of defective components and modules by ASM AS will be accompanied by a notification of defects. The supplier will usually be requested to supply the result of his investigations and the resulting corrective and preventive measures within a certain period of time. The timely statement and the quality of the definitions are part of the supplier rating.

The statement must contain a reference to the notification of defects (indication of the number and date of the notification of defects, the ASM AS material number and the number of parts).

The statement shall contain the following items in orientation 8D method, see also Appendix 11.2:

- Indication of the responsible processing individual and/or processing team
- Short description of the problem for the detected defect
- Initiated ad hoc measures with indication of the responsible individual and the deadline for completion
- Cause analysis
- Proposed measure for fault elimination
- Measure that has been taken for fault elimination with indication of the responsible individual and deadline for completion
- Measure to prevent the repetition of the problem with indication of the responsible individual and deadline for completion
- Evaluation of the effectiveness of the measure with indication of the responsible individual and deadline for completion.

7.7.3 Analyses of returned goods

For all parts, components and modules returned for repair, the contents of the repair shall be documented and evaluated by fault attributes.

These evaluations serve as the basis for cyclic quality reviews between the supplier and ASM AS.

7.7.4 Concessions

The concession is designed to provide a one-time opportunity to supply slightly defective parts to ASM AS upon prior approval.

A concession is an approval of single parts, assemblies and materials not complying with the specifications of ASM AS; this approval being limited in quantity and/or time.

A concession must always be made in writing, see Appendix 11.3. It shall be requested via the competent Purchasing department or the Incoming Inspection department of ASM AS.

A supplier's request for a concession must include:

- Description of the defect
- ASM AS material number, including the functional and product version
- Affected quantity
- Affected serial numbers
- Definition of the corrective and preventive measures for subsequent reliable and permanent avoidance of the fault.

A release can only be issued if the functionality, durability, reliability and safety of the affected products are not impaired.

A copy of the concession certificate shall be enclosed with the delivery.

7.8 Processing of Returns

7.8.1 General procedure

As a rule, returns are processed by means of repair orders.

Returns can be products

- that is sent to the supplier for repair because they were damaged at ASM AS and must be repaired.
- that exhibit quality defects for which the supplier is responsible.

When these products are delivered again, it shall be observed that the deliveries are made to execute the corresponding repair orders and not another order that is still open.

It shall be ensured that no repaired products are delivered as new products.

8 Product safety and product related environmental protection

As a fundamental principle, all manufacturers have an obligation to supply safe products.

The products supplied must not represent any hazard to life or limb, health, property or the environment.

8.1 Conformity of ASM AS products

The primary markets for sales of ASM AS products are in Europe, North America and Asia.

Suppliers and manufacturers of products are obliged to observe the norms, standards and statutory requirements that apply to their products in the relevant countries.

In addition, ASM AS must also observe the norms, standards and statutory requirements that apply to its products in these countries.

For this reason, suppliers and manufacturers of products must also observe the directives and standards listed below for the products supplied to ASM AS.

Directives and standards for Europe:

DIRECTIVE 2002/95/EU OF THE EUROPEAN PARLIAMENT AND THE COUNCIL on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

Directives and standards for P.R. China:

SJ/T 11363-2006 Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products.

SJ/T 11364-2006 Marking for Control of Pollution Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products.

Directives and standards for North America:

UL 508 Industrial Control Equipment

UL 94 Flammability of Plastic Materials for parts in Devices and Appliances

Product-related requirements in respect of norms and standards that go beyond this are defined in the product specifications.

Supplementing information and requirements to the product related environmental protection see also chapter 9.7.

8.2 Archiving

The supplier is obliged to ensure the seamless archiving of all quality-relevant documents and data for the purpose of product liability / product safety.

The archiving of documents and data forms the secure technical foundation in case of recourse.

The archiving of quality-related data and documents subject to legal safekeeping requirements must be ensured for a minimum period of ten years after delivery of the product.

Safekeeping periods exceeding the above legal minimum periods may also result from the life cycle of the corresponding products with the user or from statutory periods of limitation for product liability cases or specific applicable legal regulations, e.g. for products installed in plants.

9 Technical Requirements

The requirements and standards listed in this chapter shall apply unless other specifications are included in the product-specific documentation.

9.1 Mechanical components and assemblies

The envelope principle as defined in DIN 7167 shall apply as a tolerance standard.

9.1.1 General tolerances

Applicable standards

DIN ISO 1101	Form and orientation / position tolerance
DIN ISO 1302	Specification of surface quality
DIN ISO 2768	General tolerances

The general tolerances apply to the finished parts, including the surface according to DIN ISO 2768 Part 1 and 2. ASM AS has defined the tolerance classes "m" (T1) and "H" (T2).

9.1.2 Fits

Applicable standards

DIN ISO 286	ISO system for size limits and fits
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This standard defines the fit systems of basic hole and basic shaft as well as the terms of main dimensions, fundamental tolerances, tolerance zone, degree of tolerance and tolerance class.

9.1.3 Drilled / counter bored holes

Applicable standards

DIN 74	Counter bores for countersunk screws, except countersunk screws with heads according to DIN EN 27721
DIN ISO 13715	Edges of undefined shape - Vocabulary and indication on drawings
DIN EN ISO 15065	Counter bores for countersunk screws with standard heads according to ISO 7721
DIN 974-1 (Eng)	Counter bores for cap screws
DIN 974-2 (Eng)	Counter bores for hexagon head cap screws
DIN EN 20273	Through-holes for screws

For blind holes, the specified dimensions for hole depths without specific tolerances should be considered as minimum dimensions.

The edges that result from the production of drilled and counter bored holes must be free of burrs as defined in DIN ISO 13715.

As dimension "a" for the removal according to DIN ISO 13715, a deburred dimension of -0.1 to -0.5 mm is defined unless otherwise specified in the drawings.

The through-holes of the counter bored holes are produced according to DIN EN 20273, design "medium (m)".

9.1.4 Threads

Applicable standards

DIN 13-1	Metric ISO thread for general application – Nominal dimensions
DIN 76-1	Thread run-outs
DIN 78	Protrusion of bolt ends
DIN 7952	Sheet metal anchorage with threads
DIN ISO 261	Metric ISO thread for general application – Overview

Dimensions for thread depths without specific tolerances should be considered as minimum dimensions.

Thread run-outs / undercuts shall be designed as for the standard described in DIN 76-1.

Deviating from DIN 76-1, a 90° counter bore is permitted for internal threads, where the diameter of the counter bore shall be $1-1.05$ x of the internal diameter of the thread.

Thread ends shall be produced according to DIN 78. For external threads, a 45° chamfer shall be added, with an incomplete thread in the run-out area up to $2x P$ (P = thread lead) being permitted.

9.1.5 Quality of edges

Applicable standards

DIN ISO 13715 Edges on work pieces

The edges must be produced free of burrs according to DIN ISO 13715.

For machined parts (except plates and thin-walled parts), the dimension "a" (see DIN ISO 13715) shall be -0.1 to -0.5mm.

For plate or thin-walled parts, it must be ensured that the width of the remaining surface between two deburred edges does not become smaller than the dimension of the removed material. In cases where deburring causes new hazards of injury, the edges shall be rounded in a suitable manner or the edge quality shall be coordinated with ASM AS.

9.1.6 Quality of bends

Applicable standards

DIN 9003 Aerospace: Bending of plates and strips

The bending zones must be free from cracks and must not be coarse-grained.

9.1.7 Adhesive specifications

Applicable standards

When adhesive joints are required, the order documentation or drawings must include the corresponding information.

If such information is missing, this shall be clarified with ASM AS.

All adhesive joints shall be produced according to the relevant specifications of the adhesive manufacturers.

The retaining forces indicated in the documents are to be examined and documented by suitable measures, in order to prove process security.

9.1.8 Surfaces

Applicable standards

DIN 5033	Colorimetric, basic concepts
DIN 6174	Colorimetric determination of color differences with surface colors based on the CIELAB formula
DIN 6172	Metamerie index of paired samples in case of change of illuminants
DIN 67530	Reflektometer as an aid in the evaluation of gloss on flat coated and plastic surfaces
DIN EN ISO 2819	Metallic coatings on metallic substrates - Electrodeposited and chemically deposited coatings - Review of methods available for testing adhesion

The attributes specified in the drawings refer to the finished parts including their surface finish. Damage and scratches are always unacceptable. This applies especially to visible and plastic parts.

Electro-plated and chemically plated surfaces

Unacceptable are:

- - Blisters in the coating
- - Flaking of the coating
- - Incomplete copper or nickel plating (in case of chemically nickel-plated surfaces)
- - Burned edges and surfaces
- - Rough, matte or buddy coatings
- - Patchy surfaces, dripping zones
- - Mechanically damaged coatings

Paint-coated / powder-coated surfaces

It must be ensured that the paints / powders are processed in compliance with the specifications of the paint or powder manufacturers. The parts to be paint-coated must be free from corrosion, scale, gummed oil and other contaminations. The coated surfaces must be evenly covered and free from contamination. Coated surfaces for lining parts (hoods, doors) must be free from wax and separating compounds in order to ensure an optimum bonding of insulation materials. In the case of changes of colors or structures, a sample must be released by ASM AS. If required, the surfaces to be coated shall be provided with a primer meeting the requirements before coating.

Details regarding paint- and powder manufactures are specified in the product documentation or if necessary to ask for by the purchaser.

To avoid color differences, the paints and powders should be purchased from these manufacturers.

Uncoated surfaces

As a rule, machined surfaces, fits and threads must remain uncoated. Exceptions are specifically marked in the drawings as “coated”, “powder-coated” or similar.

Paint residues or residues of masking and wear materials on the parts are not permissible.

Uncoated or untreated surfaces of steel parts must be adequately protected against corrosion.

Recommended anticorrosion: SPC Surface Shield ML C 23411 or WD 40 (internet link: www.wd40.com)

Other surfaces

According to generally applicable technical specifications.

9.1.9 Welding / flame-cutting

Applicable standards

DIN EN 10 025	Hot-rolled products of non-alloy structural steels; technical delivery conditions
DIN EN 10 204	Metallic products - Types of inspection documents
DIN EN ISO 3834 -1	Quality requirements for welding – Fusion welding of metallic materials – Part 1: Guidelines for selection and use
DIN EN ISO 3834 -2	Part 2: Comprehensive quality requirements
DIN EN ISO 3834 -3	Part 3: Standard quality requirements
DIN EN ISO 3834 -4	Part 4: Elementary quality requirements
DIN EN 22 553	Welded, brazed and soldered joints – Symbolic representation on drawings
DIN EN 25 817	Arc-welded joints in steel – Guidance on quality levels for imperfections
DIN EN ISO 9013	Welding and related processes – Classification of qualities and dimensional tolerances for flame-cutting surfaces
DIN EN ISO 9013-5	Thermal cutting – Classification of thermal cuts
DIN EN ISO 13920	General tolerances for welded constructions – Dimensions for lengths and angles – Shape and position
DIN EN ISO 10042	Welding - Arc-welded joints in aluminum and its alloys - Quality levels for imperfections
DIN EN 287-1	Qualification test of welders - Fusion welding - Part 1: Steels; Welders must possess a certificate in accordance with this standard
DIN EN ISO 14731	Welding coordination - Tasks and responsibilities

Welders must have a certificate in accordance with DIN EN 287-1. The supplier must have or must have commissioned a welding coordinator in accordance with DIN EN ISO 14731. The supplier must meet the welding requirements as laid down in DIN EN ISO 3834.

Table 1: Observance of additional requirements

Aspect	Standard	Requirement	Additional Requirement	Comment
Material	DIN EN 10 025 Structural steels	S 235 JR G2 Material No. 1.0038	DIN EN 10 204 Works test certificate 2.2 (minimum)	
Operational requirements	DIN EN 729	Part 2 (Comprehensive) Part 3 (Standard)		Furnish evidence for welder certificates and welding supervisors
Indication in drawings	DIN EN 22 553 (ISO 2 553)			
Welding quality	DIN EN 25817 (ISO 5 817)	Classification group “C”	Undercuts “B” Excessive throat thickness “B”	Not permissible: - Spattering - Stuck wire ends - Open irregularities (e.g. pores) - Open face edges on plate parts
Flame-cutting quality (autogenous)	DIN EN ISO 9013	Cutting quality II A (or B)		Validity of tolerances unless otherwise specified
Flame-cutting quality (laser)	DIN EN ISO 9013			Validity of tolerances unless otherwise specified

9.1.10 Castings

Applicable regulations, guidelines and standards:

DIN EN 1559-1	Founding – Technical conditions of supply – Part 1: General;
DIN EN 1559-2	Founding – Technical conditions of supply – Part 2: Additional requirements for steel castings
DIN EN 1559-3	Founding – Technical conditions of supply – Part 3: Additional requirements for iron castings;
DIN EN 1559-4	Founding – Technical conditions of supply – Part 4: Additional requirements for aluminum alloy castings;
DIN EN 1559-5	Founding – Technical conditions of supply – Part 5: Additional requirements for magnesium alloy castings;
DIN EN 1559-6	Founding – Technical conditions of supply – Part 6: Additional requirements for zinc alloy castings;
DIN 1680 -1	Rough castings; general tolerances and machining allowances; general
DIN 1680 -2	Rough castings; general tolerance system
DIN 1685 -1	Rough castings of cast iron with spheroid graphite – General tolerances, machining allowances; inactive for new design
DIN EN 1563	Founding – Spheroid graphite cast irons; drafts, heat treatment
VDG P 690	Waste-wax casting – Dimensional tolerances, surfaces, machining allowances

Requirements:

Observance of the above specifications, guidelines and standards is mandatory. All runners must be removed. All cavities must be free from molding residues.

All castings shall be checked for cavitations and cracking in critical places. Any measures required to ensure the quality of the series parts shall be defined.

Any changes to / deviations from these general specifications must be defined and must be released by ASM AS.

9.2 Electrical / electronic assemblies (printed circuit boards)

9.2.1 Applicable regulations, guidelines and standards

The standards listed below shall be applied in their latest version.

General

IPC-9191 General Guidelines for Implementation of Statistical Process Control (SPC)

Assemblies

ANSI-IPC-A-610 Acceptability of Electronic Assemblies, Class 2 in general, exceptions vide among chapter 9.2.2

J-STD-001 Requirements for Soldered Electrical and Electronic Assemblies Class 2 in general

IPC-7711/7721 Rework of Electronic Assemblies Class 2 in general

Printed Boards

IPC-A-600 Acceptability of Printed Boards, Class 2 in general

IPC-6011 Generic Performance Specification for Printed Boards, Class 2 in general

IPC-6012 Qualification and Performance Specification for Rigid Printed Boards, Class 2 in general

IPC-6013 Qualification and Performance Specification for Flexible Printed Boards, Class 2 in general

IPC 6016 Printed Circuits, Printed Circuit Boards, Additional Requirements for HDI

Design:

IPC-SM-782 Surface Mount Design and Land Pattern Standard, Class 2 in general, End-Use Application (1.2.1) chapter 5

IPC-2221 Generic Standard on Printed Board Design, Class 2 in general

IPC-2222 Sectional Design Standard for Rigid Organic Printed Boards,

IPC-2223 Sectional Design Standard for Flexible Printed Boards, Class 2 in general

UL 94 Test for Flammability of Plastic Materials for Parts in Devices and Appliances

UL 508 Industrial Control Equipment

UL 508c Power Conversion Equipment

UL 840 Insulation Coordination Including Clearances and Creepage Distances for Electrical Equipment

IEC 60825-1 Safety of laser products; part 1: equipment classification, requirements and user's guide

Handling:

DIN EN 61340-5-1 Electrostatic Discharge Part 5-1: Protection of electronic components against electrostatic effects – General requirements (IEC 61340)

9.2.2 Requirements

The requirements of the guidelines and standards listed in Subsection 9.2.1 must be met to the extent that they are applicable.

For reasons of environmental protection, the manufacturing of printed circuit board shall always be based on the “no clean process”

On printed circuit boards, only display LED`s (e.g. Power ON / OFF etc.) may be used which do **not** fall in the scope of the laser protection class according to IEC 60825-1:(2002).

Electronic assemblies (printed boards) from ASM AS shall meet the requirements of Class 2 products for general industrial electronic equipment as defined by ANSI/IPC-A-610 and J-STD-001.

Exceptions from this rule include:

1. Residual wire lengths on the soldering side of printed boards. The maximum permissible cut lead length is 2mm; more accurate values shall be specified in the documentation of the printed boards.
2. Population with components: ANSI/IPC-A-610, vertical - radial leads
3. Soldered connections: ANSI/IPC-A-610, solder fillet (various chapters)

Items 2. and 3. are subject to the **Class 3** requirements for power electronics.

The acceptance at ASM AS occurs according to ANSI/IPC-A-610.

The printed circuit boards used must meet the UL requirements UL 94 V0. The UR logo, the manufacturer's logo, the board type and the flame resistance class according to UL 94 shall be etched into the board as part of the layout. The supplier shall furnish evidence of the manufacturer's UL approval during the First article testing of the assemblies.

9.2.3 Monitoring of manufacturing processes

For the statistical monitoring of the manufacturing processes, the application of the IPC-9191 "General Guidelines for Implementation of Statistical Process Control (SPC)" is recommended.

9.2.4 Repair, rework and modification

Employees, who perform repair, rework and modification operations on printed circuit boards must be qualified at the "Expert" skill level according to IPC-7721. Appropriate training certifications shall be provided. The required level of conformance is the highest level according to IPC 7711.

9.2.5 Tests on electrical / electronic assemblies (printed boards)

9.2.5.1 Incoming inspections

The purchased components, printed circuit boards and manufacturing equipment must be subjected to a defined quality test (e.g. solderability test) prior to their use.

9.2.5.2 Intermediate inspections

Suitable quality records and quality metrics must be maintained for each quality-relevant manufacturing step (solder application, assembly and soldering process). These must record the fault and rework rates as well as the initiated corrective and preventive measures for each type of assembly.

9.2.5.3 Final inspection and testing

Every printed board shall be subjected to functional testing according to the test instructions. The results shall be recorded as First Pass Yield.

The contents of the inspection shall be defined in test instructions, usually by the supplier, and released by ASM AS. The test instructions shall define the test methods, the test attributes, the test equipment, the test markings and the documentation of results.

The rework / repairs that are performed on failed assemblies shall be recorded and evaluated by fault attributes.

9.2.5.4 First article inspection on electrical / electronic assemblies (printed boards)

Test features:

- Documentation of all set point and actual values from the design specifications of the printed boards
- Use of components according to bill of materials
- Quality of workmanship and soldered joints in compliance with ANSI/IPC-A-610
- Labeling and identification of the printed boards according to requirements and design specifications
- Functional test including test set-up according to test instructions, including a listing of the actual values of the attributes to be tested
- Preparation and release of work and test plans
- Compliance with the requirements with respect to packaging and the labeling of packaging
- Evidence of compliance with UL requirements.
- Evidence on ROHS compliance if required

9.3 Cables, lines and wiring

9.3.1 Applicable regulations, guidelines and standards

DIN EN 60204-1	Safety of machinery – Electrical equipment of machines – Part 1: General requirements
DIN EN 60352-1	Solder less connections – Part 1: Wrapped connections
DIN EN 60352-2	Solder less electrical connections – Part 2: Crimped connections
DIN EN 60352-3	Solder less electrical connections – Part 3: Solder less accessible insulation displacement connections
DIN EN 60352-4	Solder less electrical connections – Part 4: Solder less non-accessible insulation displacement connections
DIN EN 60998-2	Part 1 – 4 Requirements for connecting devices as separate entities with screw-type and screw less-type clamping
UL 94	Test for Flammability of Plastic Materials for Parts in Devices and Appliances
VDE 0100	Erection of power installations with rated voltages below 1000V
VDE 0611	Extraction force of conductor
DIN EN 60947-1 Table 4	Tightening torque for the proof of the mechanical stability of screw connections/- terminals

9.3.2 Requirements

The requirements of the guidelines and standards that are listed in Subsection 9.3.1 must be met to the extent that they are applicable.

Crimped designs (burrs, cracking, asymmetry and distortion) as well as gas-tightness (all individual wires must be deformed into polygons and distributed evenly), extraction forces and crimping heights must comply with the relevant design specifications.

Insulation crimping connections shall meet the relevant design specifications.

The contacts to be used are specified in the bills of materials.

The use of ring lugs on current-carrying cables and wires must be avoided!

9.3.3 Tests on prefabricated cables and lines

9.3.3.1 Electrical test

Scope of test: 100%

Cables and lines with fitted connectors shall be tested for continuity of the individual conductors and for short-circuits between conductors. The connectors shall be included in the testing. The test must detect incorrect or missing connector pin assignments and coding.

For cables fitted with wire end ferrules, each conductor shall be tested for continuity. For shielded cables, the shield shall be treated as another conductor in the test.

9.3.3.2 Process protection of crimping quality

In order to receive a process-safe functioning crimping connection, a clean stripping must be ensured.

The verification for the process capability of the stripping and crimping process must take place according to the definitions and standards defined in the requirements.

The set up of the stripping devices must be examined and tested. These examinations make the production of the cables both within the range of the material condition of the isolation, as well as the dimensions necessary before each stripping a new load.

9.3.3.3 Visual / measuring inspections

Test of cable type (based on order documentation):

- Number of inner conductors
- Colors of conductors (e.g. with respect to connector pin assignment)
- Overall shield, filler cord wire (if available)
- Numbering / coding of conductors
- Check of cord structure:
- Cross-sections of individual conductors
- Shield, filler cord wire (if available)

- Implementation of protective and heat-shrink tubing depending on place of use or type of installation and based on the state of the art
- Verification of cable dimensions against indications in drawings:
 - Total length
 - Stripped length (for round cable)
 - Splicing length (for ribbon cable)
 - Shield.

Check of the surface quality of the cable jack for damage.

Check of the jack stripping / splicing length and the insulation stripping for damage.

Check for cables and lines fitted with connectors:

- Check of the connector type and the connecting elements against the order documentation
- Check of the assembly connector and strain relief or armored conduit union
- Attachment of cable on connector housing (e.g. that the cable jack has been sufficiently inserted through the armored conduit union and attached)
- Check of the proper mechanical assembly of connector housings (e.g. it must be ensured that the crimp contact is fixed and locked in the connector housing)
- Check of the identity and identification of the prefabricated cable / line including connector designations.
- Regular examination of the pins and connectors of the testing set on mechanical damage according to the permissible number of plugging of the used connector of the testing set. Exchange of pins and connectors of the testing set when recognizable damages are visible, not to damage the test items. Take up the Check into regular calibration proceeding.

Check of the position of the labeling against the requirements.

For cables with screwed-on connectors, the extraction forces (VDE 0611) as well as the tightening torques (DIN EN 60947-1 Table 4) must be checked and documented. The relevant processing guidelines of the manufacturers must be observed.

9.3.3.4 First article inspection on prefabricated cables, lines, wiring

Test features:

- Documentation of all set point and actual values from the design specifications
- Use of components according to bill of materials
- Furnishing of evidence for the process capability of crimping processes
- Labeling and identification of cables and lines according to design specifications and definitions in this TCO
- Confirmation of the electrical tests including test set-up according to test instructions
- Preparation and release of work and test plans
- Confirmation of compliance with requirements with respect to visual and measuring tests.
- Evidence on ROHS compliance if required

9.4 Functional modules

The requirements for the functional modules result from the requirements for the individual components, which are defined in the corresponding chapters.

With respect to the quality of design of functional modules, special attention must be paid to the compliance with the surface requirements, as well as to the prevention of injury hazards (sharp edges, pinching areas etc.). Additional requirements for the installation of assemblies (e.g. wiring and piping) shall be coordinated with ASM AS unless specified in the documentation.

As a rule, functional modules must be subjected to functional tests. The result must be recorded as FPY and made available to ASM AS on request. The type, method and extent of functional testing shall be coordinated with ASM AS if required.

In order to ensure that all necessary test steps have been executed and that all components on the functional modules are present at the time of delivery, the supplier should prepare checklists that can ensure systematic execution.

9.4.1 First article inspection on functional modules

The supplier shall conduct the first article inspection of functional modules as required in the sense of a product audit. The content of first article inspection can also be the auditing of product-related order processing operation including the sourcing processes.

The goal of this procedure is the protection of all quality-relevant parameters so that the compliance with the quality requirements for the series deliveries is guaranteed.

If a first article inspection at the supplier is planned, the supplier is obliged to coordinate a date for the upcoming first article inspection with ASM AS in a timely manner.

9.5 Packaging and transport

9.5.1 General preliminary considerations and scope of application

The packaging constitutes the protection against damage or other impairment that could affect the quality of the packaged good.

This is the basis for the requirements that are derived from the use of the packaging in the supply chain from the supplier via ASM AS and possibly all the way to the end customer.

Based on the properties of the packaged item of goods (fragility, size, weight etc.), all influences within the chain (packing – transport – storage – unpacking – and possibly the subsequent chain to the customer) must be considered with respect to the stress exerted on the packaging and the packaged good.

In the selection of packaging methods, packing equipment and packing materials, the legal provisions of the countries of delivery and of destination must be observed with respect to the packaging.

For Germany, this shall particularly include the packaging legislation and possibly also the waste legislation. Particular attention shall be paid to aspects of the avoidance of excess packaging material and its reuse or recycling, respectively. Reusable packaging shall be preferred.

For the definition of the packaging, the cooperation with packaging specialists is recommended.

The packaging is made in packing units according to the specifications of ASM AS. Painted and electroplated parts shall be packaged so that mutual damage is excluded (except bulk goods).

9.5.2 Applicable specifications, guidelines and standards

These regulations, guidelines and standards only represent a foundation of instructions. In special cases, the additional instructions contained in these documents shall be observed.

DIN 55405	Packaging; terminology; packaging, Parts 1-7: Packing material, packaging equipment, packaging auxiliaries, packaging for goods, packing, types of sealing, dimensions, packaging test
DIN 55402	Shipping marks for packages Part 1 Pictorial marking for handling Part 2 Pictorial marking, guideline for export packaging
DIN EN ISO 780	Pictorial marking for the handling of goods
DIN EN 24180-1	Packages ready for shipping; general rules for the compilation of performance test schedules; Part 1: General principles
DIN EN 24180-2	Packages ready for shipping; general rules for the compilation of performance test schedules; Part 2: Stress and load parameters
DIN EN 61340-5-1	Electrostatic Discharge Part 5-1: Protection of electronic components against electrostatic effects – General requirements (IEC 61340) Classification of environmental condition
DIN EN 60068-2-32	Basic environmental testing procedures Part 2 Tests; tested: Free fall; analog application in packaged condition only.

9.5.3 First article inspection on packaging

The inspection of the packaging is part of the first article inspection of the ordered item of goods.

The packaging must be adequately implemented in compliance with the fragility characteristics.

The supplier shall conduct the test of the requirements for the packaging in compliance with the packaging standards (e.g. fall test, climatic test, shock test, pressure test etc.) or furnish evidence of compliance by means of material certificates in the first article inspection report.

As a minimum inspection, the fall test – free fall – shall be conducted. (Test here: DIN EN 24180-1 and 2; DIN EN 60068-2-32 analogously in packaged condition). The initial orientation is the usual transport orientation.

Final visual inspection of the packaging and functional test of the packaged good.

Evidence on ROHS compliance if required

9.6 Product labeling

The labeling of components and assemblies ensures their identification and traceability.

These definitions for labeling are considered the standard definitions. The technical documentation will usually contain references to these definitions. The location of the labeling and the maximum available space for the labeling are also specified in the technical documentation.

Should other labels and requirements apply for specific products than those specified here, the corresponding definitions will be contained in the product-specific documentation.

9.6.1 General requirements

Labeling method: Adhesive label, print, engraving, laser marking, stamping, etching, eroding, other methods as agreed with ASM AS.

- Permanent attachment to support material
- Abrasion resistance of the labeling
- Functional impairments must be excluded.
- Maximum resistance against solvents and contamination
- Temperature resistance in the range of -20°C to +70°C
- Non-conductive labels on electric assemblies
- Labeling should be visible in the installed condition, if possible
- Labeling should be legible even after surface treatment
- Font: Helvetica or Arial; other fonts to be agreed with ASM AS
- Character size: 1.5mm minimum (5 pts)
- Single line spacing
- Centered orientation.

9.6.2 Requirements for label markings

Acrylate butyl adhesive for labels, PNS adhesive type and adhesive strength class T according to DIN 30646

The label size depends on the available space and the content of the label; the use of standard labels on sheets or reels is practical.

Label background color: white

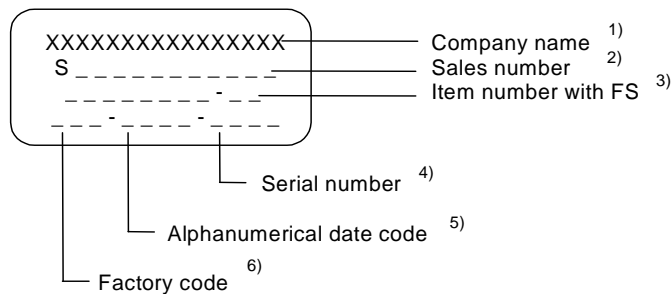
Font color: black

9.6.3 Labeling design

9.6.3.1 Individual parts, functional assemblies and purchased assemblies

These include manufactured parts and assemblies as well as purchased assemblies that need to be labeled to achieve a clear identification and traceability.

Fully designed labeling layout

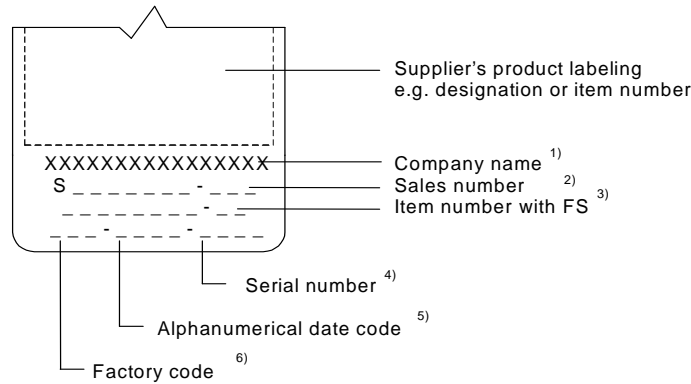


- ad 1): Company name "ASM AS GmbH & Co. KG" (short: "ASM AS" if not enough space on tag).
- ad 2): The sales number is specified in the order documents, otherwise this line remains blank.
- ad 3): The part number with FS (functional version) is specified in the manufacturing documentation.
- ad 4): The serial number must be specified if unique traceability is required.
- ad 5): The alphanumerical date code is defined in Subsection 9.6.4.
- ad 6): The factory code is specified by Purchasing.

Alternative designs:

In the case of insufficient space, the labeling may have a two-line or two-part (two separate labels / fields) design.

The required labeling may be integrated with the supplier's product labeling (see example):



Layout with smallest space conditions

With smallest space conditions at least the marking of the production plant is necessary. The characteristic for the production plant is communicated by ASM AS purchasing.

If more space should be available, it is to be indicated additionally in the labeling depending upon available place:

- the Series/counting number, if clear parts-related traceability is necessary
- the Letter/number key date is defined in section 9.6.4.

With further available place:

- the article number with FS (function conditions), which is to be taken out of the documents.
-

9.6.3.2 Labeling using 2D barcode

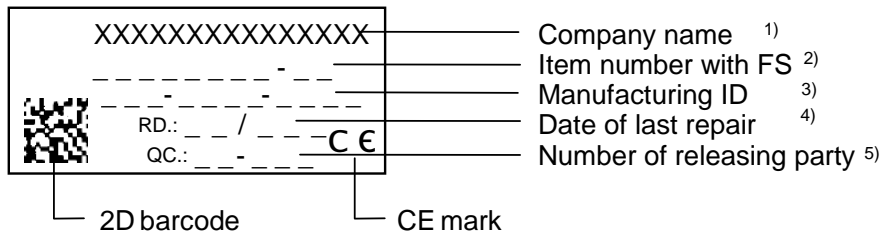
For reasons of traceability, a labeling using 2D barcode can be required as an alternative to the standard labeling. In such cases, the manufacturing documentation will contain the note: "Product labeling using 2D barcode according to TBL".

Permissible labeling types are thermal transfer printing, laser printing or direct inkjet printing.

The design of the entire labeling using 2D barcode shall be submitted to the customer on First articles for verification.

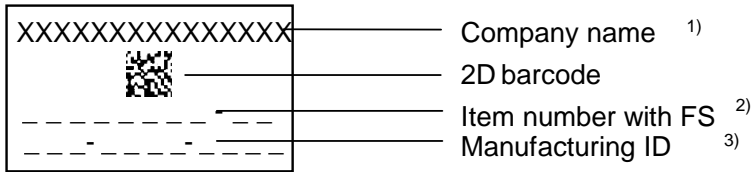
Design requirements

Standard layout:



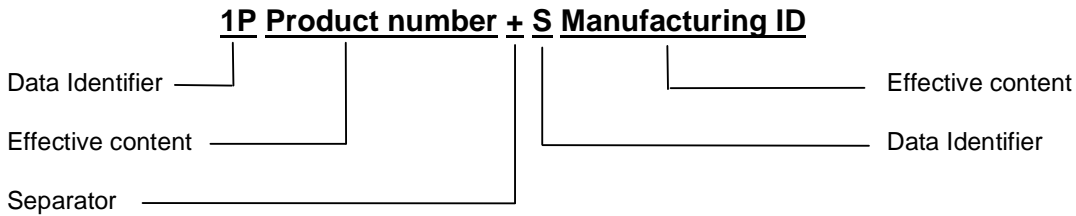
- ad 1): Company name "ASM AS GmbH & Co. KG" (short: "ASM AS" if not enough space on tag).
- ad 2): The item number with FS (functional version) is specified in the manufacturing documentation.
- ad 3): The manufacturing ID consists of:
- Factory code: Is specified by Purchasing
- Alphanumerical date code: Defined in Subsection 9.6.4
- Serial number: To be specified by supplier on specific request of customer only
- ad 4): Date of last repair: Date in plain text, e.g. 03/2003
- ad 5): Number of releasing party: Optional, on specific request of customer only

Layout in case of restricted space



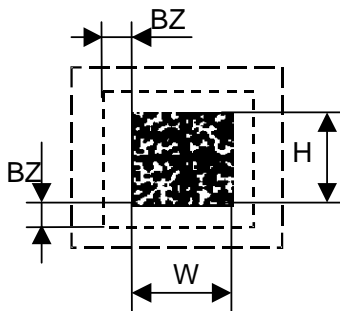
The 2D coding shall be implemented in Data Matrix ECC 200 according to ISO/IEC 16022.

The data string of the code has the following information content (without spaces):



Product number: Item number with functional version
 Manufacturing ID: Factory code, alphanumerical code and serial number

Design of printing and blank zones:



The blank zone BZ shall be designed as a function of the barcode resolution X at $\geq 2X$.

The resolution is determined by the application and must be adequate for the labeling and reading technology used. The resolution according to ISO/IEC 16022 is $X \geq 0.25\text{mm}$. Higher resolutions are possible but are subject to legibility testing by the customer.

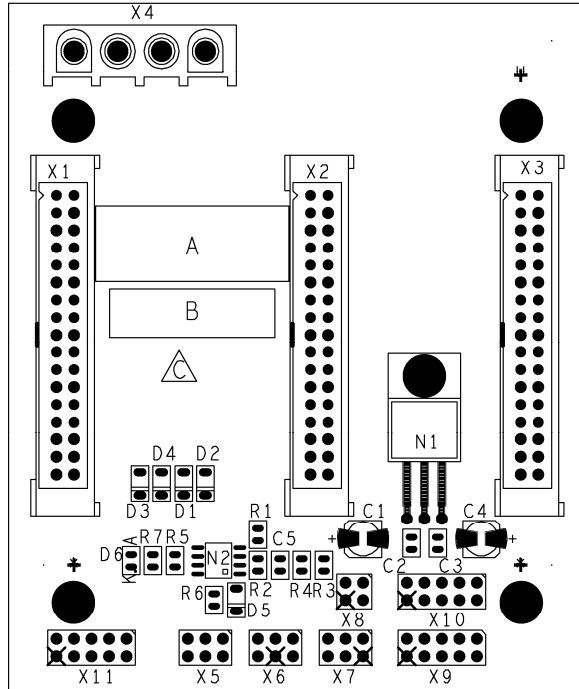
The width W and height H of the barcode depend on the resolution X and the number of characters in the data string. This yields e.g. the following results:

- for a resolution with 6 dots and 53 characters, a barcode size of 6.6mm
- for a resolution with 4 dots and 53 characters, a barcode size of 4.4mm
- for a resolution with 4 dots and 15 characters, a barcode size of 2.4mm

9.6.3.3 Electrical / electronic assemblies (printed circuit boards)

Labeling methods:

- For the entire assembly: Adhesive label
- For the board: Print, engraving, laser printing, in Cu (in layout); other methods as agreed with ASM AS. The location of the labeling is specified in the component mounting diagram (see example below).
 The UR logo, the manufacturer logo, the board type and the flammability class according to UL 94 must be etched on the board as part of the layout.

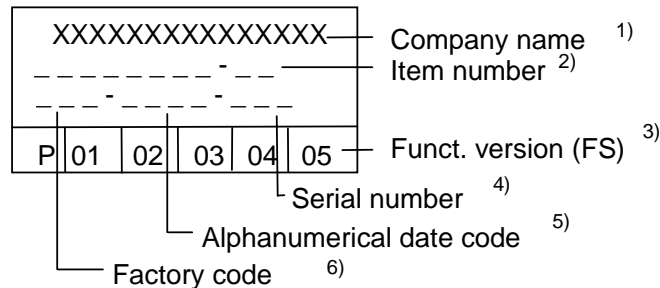


X KEY PIN
 A = IDENTIFICATION LABEL
 B = TEST LABEL
 C = ESD LABEL

The locations of the labeling are defined in the component mounting diagram of the printed circuit board. Each location is identified with a letter code (A, B, C) and an outline.

In case of **difficult space conditions**, the contents may be distributed among several locations (partial labeling B1 .. Bn).

Fully designed labeling layout for printed boards (A = Identification label)

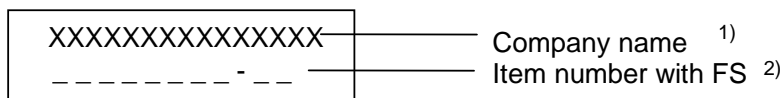


- ad 1): Company name "ASM AS GmbH & Co. KG" (short: "ASM AS" if not enough space on tag).
- ad 2): The part number is specified in the manufacturing documentation. **Optionally**, the functional version can be specified with the part number. Example: 03001234-01.
- ad 3): The functional version (FS) is specified in the manufacturing documentation (check).
- ad 4): The serial number must be specified if unique traceability is required.
- ad 5): The alphanumerical date code is defined in Subsection 9.6.4.
- ad 6): The factory code is specified by Purchasing.

If the actual functional version is higher than provided for on the label, a functional version scheme with the next higher numbering block (e.g. |06|07|08|09|10| etc.) must be used. "P" designates the prototype status.

In case of **difficult space conditions**, the contents may be distributed among several locations (partial labeling A1 .. An).

Externally developed standard printed boards



- ad 1): The company name (currently ASM Assembly Systems) is specified in the order text.
- ad 2): The item number with FS (functional version) is specified in the manufacturing documentation.

In addition to the labeling shown, the supplier must mark these products with his manufacturer name or manufacturer code, type designation, serial number and/or the manufacturing date.

9.6.3.4 Prefabricated cables, wires and pneumatic lines

Attaching labels to cables:

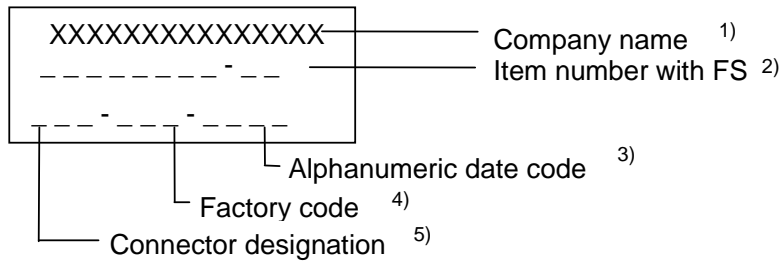
As a rule, labels must be attached to both ends of the cable. For cables with a length under 200mm, one label that shows both connector designations and is located in the middle is sufficient.

The labeling must always remain fully legible in the installed condition of the cable. For very thin cables (e.g. individual conductors), the label shall be attached in the form of a tag, where the labeling field shall also be covered with the transparent part of the label.

Basic information about the prefabrication and the required identification features with respect to cables, lines, connectors and wiring are specified in the order documentation.

Unless otherwise specified in the order documentation, the labels shall be attached in the following locations:

- on stripped cable: on the cable jacket at 20–30mm from the end of the jacket
- on ribbon cable: on the cable at 20–30mm from the connector



- ad 1): Company name "ASM AS GmbH & Co. KG" (short: "ASM AS" if not enough space on tag).
- ad 2): Item number with (functional version) of the corresponding prefabricated cable.
- ad 3): The alphanumeric date code is defined in Subsection 9.6.4.
- ad 4): The factory code is specified by Purchasing.
- ad 5): The connector designations are specified in the corresponding documents for the item. The connector designation is eliminated for cable ends without installed connector (see also paragraph on "connector markings").

Alternative marking (without label):

As an alternative to labels, markings on the cable jack, on individual conductors and on connectors are also permissible. The general requirements such as legibility, resistance to abrasion and resistance to solvents and contamination must be met. Such markings must not cause any damage.

Marking sequence / location:

Markings on cable jack:

The connector designations must be located next to the corresponding connector, followed by the company name, the item number with functional version (FS), the manufacturer ID and the manufacturing date (coded). The individual indications shall be separated by spaces.

Example: [Connector] [approx. 10mm] **x5rh_ASM AS_03001234-01_XXX_RO30**

Beginning and end of markings: approx. **10mm** from beginning or end of cable jack, outside cable ties and legible in assembled condition.

Markings on individual conductors:

The connector / PIN designations must be located next to the corresponding connector, followed by the company name, the item number with functional version (FS), the manufacturer ID and the manufacturing date (coded). The individual indications shall be separated by spaces.

Example: [Connector] [approx. 20mm] **x5rh/1_03001234-01_XXX_RO30**

If the identification of the item number with FS, the manufacturer and the manufacturing date is ensured via the labeling of the assembly (e.g. for cable trunks, harnesses), these indications are eliminated in the marking on single conductors.

Example: [Connector] [approx. 20mm] **x5rh/1**

Beginning and end of markings: approx. **20mm** from end of connector / conductor, outside cable ties and legible in assembled condition.

Markings on ribbon cables:

Markings directly on ribbon cables shall be implemented in compliance with the contents of the labels.

Connector markings:

When the product-specific documentation calls for connector markings directly on the connector, these must meet the general requirements such as legibility, resistance to abrasion and resistance to solvents and contamination. The design of the marking is at the discretion of the supplier.

Pneumatic lines:

The labeling of pneumatic lines is governed by the same provisions as for cables; however, such labeling must be requested in the product-specific documentation.

9.6.4 Coding of manufacturing date

Table 1: Year of manufacture

Calendar year	Code 1)
1970, 1990, 2010	A
1971, 1991, 2011	B
1972, 1992, 2012	C
1973, 1993, 2013	D
1974, 1994, 2014	E
1975, 1995, 2015	F
1976, 1996, 2016	H (G) 2)
1977, 1997, 2017	J
1978, 1998, 2018	K
1979, 1999, 2019	L
1980, 2000, 2020	M
1981, 2001, 2021	N
1982, 2002, 2022	P
1983, 2003, 2023	R
1984, 2004, 2024	S
1985, 2005, 2025	T
1986, 2006, 2026	U
1987, 2007, 2027	V
1988, 2008, 2028	W
1989, 2009, 2029	X
1) Complies with DIN EN 60062	
2) The letter G is prohibited for new applications because it does not comply with DIN EN 60062. It is only used for retro-coding.	

Table 2: Month of manufacture

Month	Code 1)
January	1
February	2
March	3
April	4
May	5
June	6
July	7
August	8
September	9
October	O ("Oh")
November	N
December	D
1) Complies with DIN EN 60062	

Table 3: Day of manufacture

Day of Month	Code
1 st to 31 st day	01 to 31

Examples of date indications:

DD31 Calendar year 1993, Month of December, 31st day

N505 Calendar year 2001, Month of May, 5th day

L815 Calendar year 1999, Month of August, 15th day

Date code including year, month and day:

9.6.5 Labeling on packaging

Deliveries must be adequately marked to enable their unique assignment to the associated delivery documents. The delivery documents must contain information about the supplied material with the associated order numbers and the respective orders.

The labeling and identification of the packaging itself (here: outer or transport packaging) shall include the commonly used pictorial markings that are used by the packaging trade to describe the handling of goods (e.g. Fragile / Delicate Goods, Up, Protect against humidity, ESD, prescribed transport etc.).

Requirement according to:

DIN 55402 Part 1 and 2 Shipping marks for packages

DIN EN ISO 780 Pictorial marking for the handling of goods

As a rule, the packaged goods must be identified by means of the nameplate.

Packing of magnetic material

The packing of magnetic material with magnetic pull more largely or equal 50N, have to be provided with a warning sticker, which refers to the possible dangers in handling magnets.

Example of inscription:

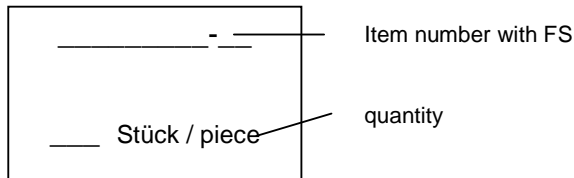


Vorsicht starke Magnete !
 Starke Anziehungskräfte !
 Verletzungsgefahr durch Quetschung !
 Caution strong magnets!
 Strong attraction forces!
 Danger of injury by crushing!

Packing subunits

If not given by ASM AS particularly, packing subunits fixed by the supplier must be marked with the ASM item number and the packing quantity.

The delivery volume must be divided into same subsets.



9.7 Guidelines on environmental compatible product design

9.7.1 Procurement and manufacturing aspects

- Minimizing production waste by means of appropriate product design
- Taking account on environmental aspects in selection an procurement of semi-finished products, components and OEM products
- Complying with legal bas and restrictions as well as with the avoidance list in the selection of material and components
- Avoiding the use of hazardous materials in the manufacturing of products
- Minimizing energy consumption in manufacturing
- Obtaining information on the environmentally relevant properties of the semi-finished products, components and OEM-products
- Minimizing the amount of packaging (weight, volume)
- Optimizing the environmental compatibility of the packaging in relation to the selection of material and logistics consideration

9.7.2 Product use aspects

- Minimizing energy consumption in idle status or during operation
- Minimizing consumption of operation materials
- Excluding the possibility of harm to the environment or health caused by the materials used or by noise
- Drawing attention to operation methods that conserve resources (energy, water, etc.)
- Drawing attention to the environmental compatible disposal of consumables (batteries, toner, etc.)

9.7.3 Prohibited substances and substances to be declared

The list of prohibited substances (see 9.7.4) gives a simplified survey over the legal position within the EC, Switzerland and the US concerning restrictions of substances. It contains a selection of substances, the distribution of which in products and electrical and electronic industries as well as in the appendant consumable is subject to legal prohibitions, as given in the table.

The legislator has permitted more exceptions to the prohibitions for some substances ("yes" in the table means, that exceptions are relevant to the electrical and electronic industries).

By it uninfluenced, the PRODUCTS must agree with all regulations valid in the European community, in particular regarding restriction of contents materials in products (e.g. Regulation (EC) 2037/2000, Regulation (EC) 850/2006, Regulation (EC) 842/2006, Guideline 1907/2006 EEC)

The supplier must inform ASM AS, as soon as one of the indicated limit values is exceeded, or a special exception is taken up.

In particular the supplier must follow his duty to supply information according to the guideline 1907/2006 EEC (Reach regulation) in accordance with „the list of candidates“ defined there. For the materials led there, an obligation to inform exists.

The PRODUCTS must correspond to the requirements of the guideline 2002/95/EC for the restriction of the use of dangerous materials (RoHS).

The obligation resulting from Directive 2002/96/EC on Electrical and Electronic Equipment ("WEEE Directive") to declare materials and components that are to treat separately according to annex II of this directive is to be considered.

9.7.4 Summary of bans or restrictions on the distribution of hazardous substances, valid in EC, in Switzerland and some other countries

A current overview of the prohibition substances and substances to be declared you find in the SIPLACE Internet. http://www.siplace.com/14445/About-Us/Suppliers/aud_index.aspx

Substance/ substance group	CAS No.	Affected application	Limit value (wt.-%) ¹⁾	Ex- ceptions	Legal regulations ²⁾
Plastics and rubber parts, wire insulation, coats of lacquer					
Polyvinylchloride (PVC)		Electrical and electronic equipment	0.1	yes	EU 2002/95/EC + 2005/618/EC CH ChemRRV App. 1.9
Polybrominated diphenyl-ethers (PBDEs)		Electrical and electronic equipment	0.1	yes	EU 2002/95/EC + 2005/618/EC CH ChemRRV App. 1.9
Octabromodiphenyl-ether (OBDE)	32536-52-0	All applications	0.1	yes	EU 76/759/EEC
Pentabromodiphenyl-ether (PBDEs)	32534-81-9	All applications	0.1	yes	EU 76/759/EEC
Short-chain chlorinated paraffins (SCCPs)		Sealing compounds	1.0	yes	CH ChemRRV App. 1.2
Lead and lead compounds		Paints and varnishings	0.01	yes	CH ChemRRV App. 2.8
Cadmium and cadmium compounds		Figments in plastics	0.01	yes	EU 76/759/EEC
		Stabilized vinyl chloride polymers and copolymers (e.g. PVC)	0.01	yes	CH ChemRRV App. 2.9, 2.16(2) DK Statutory Order No. 1199
		Paints and varnishings	0.01	yes	CH ChemRRV App. 2.8
Insulating materials					
Asbestos	1332-21-4 (see below ³⁾)	All applications	0.1 (total)	yes	EU 76/759/EEC
Main-made vitreous (silicate) fibres		Articles for heat and noise reduction in building construction including technical insulation and for ventilation systems	0.1 (total)	yes	CH ChemRRV App. 1.6 DE ChemVerbotsV
Other materials (e.g. wood)					
Formaldehyd	50-30-0	Wood	n.g.	yes	EU 76/759/EEC
Creosote	8001-68-9	Wood and wooden materials	n.g.	yes	EU 76/759/EEC
Pentachlorophenol (PCP)	87-86-5	All applications	0.000 5 (total)	yes	EU 76/759/EEC
Pentachlorophenol, sodium salt	131-52-2	All applications	0.000 5 (total)	yes	EU 76/759/EEC
Other PCP salts and compounds		All applications	0.000 5 (total)	yes	EU 76/759/EEC
Coolants, insulating gases and liquids, fire extinguishing agents					
CFCs and halons	see below ⁴⁾	Aerosols	1.0	yes	EU 2037/2000
		Coolants	1.0	yes	US CAA (42 USC 7571 et seq.)
		Foam plastics	n.g.	yes	CH ChemRRV App. 1.4, 2.3, 2.9-12
		Cleaning agents and solvents	1.0	yes	EU 2037/2000
		Extinguishing agents	1.0	yes	EU 2037/2000
HFCs		Use in cooling and air-conditioning devices	n.g.	yes	EU Regulation No. 842/2006
FCs		Fire protection systems and fire extinguishers	n.g.	yes	EU Regulation No. 842/2006
HCFCs		Non-confined direct-evaporation systems containing refrigerants	n.g.	yes	EU Regulation No. 842/2006
FCs		Cooling and air conditioning equipment	n.g.	yes	AT 5GBI Nr. 447/2002
HFCs		One component foams	n.g.	yes	EU Regulation No. 842/2006
Sulfur hexafluoride (SF ₆)	2551-62-4	One component foams	n.g.	yes	EU Regulation No. 842/2006

Substance/ substance group	CAS No.	Affected application	Limit value (wt.-%) ¹⁾	Ex- ceptions	Legal regulations ²⁾
Electrical and electronic equipment and components, metal, glass and ceramic parts					
Lead	7439-92-1	Electrical and electronic equipment	0.1	yes	EU 2002/95/EC + 2005/618/EC CH ChemRRV App. 2.16(1)
Cadmium	7440-43-9	Electrical and electronic equipment	0.01	yes	EU 2002/95/EC + 2005/618/EC CH ChemRRV App. 2.16(1)
Cadmium compounds		Metal surface coating	n.a.	yes	EU 76/759/EEC DK Statutory Order No. 1199
Mercury	7439-97-6	Zinc layers	0.025	yes	CH ChemRRV App. 2.16(3)
Mercury compounds		Electrical and electronic equipment	0.1	yes	EU 2002/95/EC + 2005/618/EC
		All applications	n.a.	yes	CH ChemRRV App. 1.7
Hexavalent chromium (Cr ^{VI})		Electrical and electronic equipment	0.1	yes	NL Decree 9 September 1999 SE SFS 1999:944
Polybrominated biphenyls (PBBS)		Electrical and electronic equipment	0.1	yes	EU 2002/95/EC + 2005/618/EC CH ChemRRV App. 2.16(1)
Polybrominated diphenyl-ethers (PBDEs)		Electrical and electronic equipment	0.1	yes	EU 2002/95/EC + 2005/618/EC CH ChemRRV App. 1.9
Octabromodiphenyl-ether (OBDE)	32536-52-0	All applications	0.1	yes	EU 76/759/EEC
Pentabromodiphenyl-ether (PBDE)	32534-81-9	All applications	0.1	yes	EU 76/759/EEC
Batteries and accumulators					
Lead	7439-92-1	Fixed batteries ⁶⁾	0.1	yes	CH ChemRRV App. 2.15
Cadmium	7440-43-9	Portable batteries and accumulators	0.002	yes	EU 2006/66/EC
		Zinc-carbon batteries	0.015	yes	CH ChemRRV App. 2.15
		Fixed batteries ⁶⁾	0.015	yes	EU 2006/66/EC
Mercury	7439-97-6	Batteries and accumulators	0.000 5	yes	EU 2006/66/EC
		Fixed batteries ⁶⁾	0.000 5	yes	CH ChemRRV App. 2.15
		Button cells and batteries composed of button cells	2	yes	EU 2006/66/EC
		Alkali-manganese batteries	0.000 5	yes	CH ChemRRV App. 2.15
		Zinc-carbon batteries	0.000 5	yes	CH ChemRRV App. 2.15

Substance/ substance group	CAS No.	Affected application	Limit value (wt.-%) ¹⁾	Ex- em- ptions	Legal regulations ²⁾
HFCs			n.g.		DK Statutory Order no. 552 of 2 July 2002
HFCs (C ₁ to C ₃) HBrFCs (C ₁ to C ₃) Methyl bromide	74-83-9 2551-62-4	Cooling plants, heat pumps, air conditioning plants (comfort cooling) and dehumidifiers with charges ≤ 10 kg All applications	n.g.	yes	CH ChemRRV App. 1.4, 2.3, 2.9-12 AT BGBl. Nr. 447/2002
Sulfur hexafluoride (SF ₆)	2551-62-4	Insulating and quenching gas in electrical systems and appliances up to 1 kV (over 1kV obligation to report) Low voltage plants (≤ 1 kV) All applications (over 1 kg obligation to report in cases of exceptions)	n.g.		DK Statutory Order no. 552 of 2 July 2002 CH ChemRRV App. 1.5
Polychlorinated biphenyls (PCBs)	1336-36-3	All applications	0.005 (total)	yes	EU 76769/EEC
Polychlorinated terphenyls (PCTs)	61786-33-6		n.g.		CH ChemRRV App. 1.1, 2.14
Monomethyltetrachlorodiphenylmethane (UGlic 141)	76253-60-6				
Monomethyldichlorodiphenylmethane (UGlic 121 or 21)	99686-47-9				
Monomethyldibromodiphenylmethane (DBBT)					
Polychlorinated biphenyls (PCBs)	1336-36-3	Not totally enclosed	0.05	yes	US TSCA (15 USC 2605) + 40 CFR 761
Halogenated biphenyls, terphenyls, naphthalenes		All applications	n.g.		CH ChemRRV App. 1.1
Halogenated aromatic compounds		Capacitors and transformers	0.05/0.005 (mono-/polyhalogenated)		CH ChemRRV App. 2.14
Perfluorooctane sulfonic acid and its metal salts, halides, amides, and other derivatives including polymers (PFOS)		All applications	0.1	yes	EU 76769/EEC
Packaging					
Heavy metals (lead, cadmium, hexavalent chromium, mercury)		Packaging and packaging components	0.01 (total)		EU 94/62/EC CH ChemRRV App. 2.16(4)
Cleaning agents					
Aliphatic CHCs	s. u. ³⁾	All applications	0.1 (total)	yes	EU 76769/EEC CH ChemRRV App. 1.3
1,1,1-Trichloroethane Tetrachloroethane	71-55-6 56-23-5	All applications	n.g.		CH ChemRRV App. 1.4

Notes

1) "n.g." means that no limit value is given in the legislation. In these cases the legally given concentration limits for taking substances into account are to be observed.

2) Country codes according to ISO 3166

- ChemVerbotsv
CAA German chemicals prohibition ordinance (Chemikalienverbotsverordnung)
- KIFS Swedish National Chemicals Inspectorate's Regulations (Kemikalieinspektionens föreskrifter)
- RoHS Directive of the European Parliament and the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (Directive 2002/95/EC)
- SFS Swedish Code of Statutes (Svensk författningssamling)
- ChemRRV Swiss ordinance on reduction of chemical risks (Chemikalien-Risikoreduktions-Verordnung)
- TSCA Toxic Substances Control Act

- 3) Aliphatic CHCs
 - Tetrachloroethane 56-23-5
 - 1,1,2,2-Tetrachloroethane 79-34-5
 - 1,1,1,2-Tetrachloroethane 630-20-6
 - Pentachloroethane 76-01-7
 - Trichloromethane (Chloroform) 67-66-3
 - 1,1,1-Trichloroethane 71-55-6
 - 1,1,2-Trichloroethane 79-00-5
 - 1,1-Dichloroethylene 75-35-4
- 4) Asbestos
 - Actinolite 77536-66-4
 - Amosite 12172-73-5
 - Anthophyllite 77536-67-5
 - Chrysotile 12001-29-5
 - Crocidolite 12001-28-4
 - Tremolite 77536-68-6
- 5) CFCs/Halons
 - Trichlorofluoromethane (R11) 75-69-4
 - Dichlorodifluoromethane (R12) 75-71-8
 - Chlorotrifluoromethane (R13) 75-72-9
 - Tetrachlorodifluoroethane (R112) 76-11-9
 - Trichlorotrifluoroethane (R113) 76-13-1
 - Dichlorodifluoroethane (R114) 76-14-2
 - Chlorotrifluoroethane (R115) 76-15-3
 - Bromochlorodifluoromethane (Halon 1211) 353-89-3
 - Bromotrifluoroethane (Halon 1301) 75-69-8
 - Dibromotetrafluoroethane (Halon 2402) 124-73-2
 - Tetrachloroethane 1,1,1-Trichloroethane 56-23-5
 - Chlorodifluoroethane (R22) 71-55-6
 - 75-45-6

6) Fixed batteries are those which cannot be removed without effort from the appliances. They are either soldered, welded or in some other manner permanently connected to the contacts.

10 Definition of Terms and Abbreviations

ANSI	American National Standards Institute
Cp	Process capability index to describe the variation of a manufacturing process.
Cpk	Process capability index that also considers the position of the mean value of the frequency distribution in relation to the specification limits, in addition to the variation of a manufacturing process.
dpm	Defects per million
ES	Product version as part of the ASM AS drawing number
ESD	Electrostatic sensitive device
First Pass Yield (FPY)	Percentage of assemblies in the manufacturing process that have passed all tests without any rework
FMEA	Failure Mode and Effects Analysis
FS	Functional version as part of the material number of the module or single part
FTA	Fault Tree Analysis
IEC	International Electro-technical Commission
IPC	Formerly Interconnecting and Packaging Electronic Circuits: Association Connecting Electronic Industries
J-STD	Joint Industry Standard
LH/PH	Requirement specification / Functional specification
Mch	Munich / Germany
MCT	Maturity Capability Test
ASM AS	ASM Assembly Systems
SPC	Statistical Process Control
PCB	Printed Circuit Board
ppm	Parts per million
QM	Quality Management
QAA	Quality assurance agreement to ensure the quality of supplies
TCOD	Technical Conditions of Orders and Deliveries
UL	Underwriters Laboratories Inc. (relevant standards organization for the North American market)
US	Documentation version as part of the ASM AS drawing number
VBG4	Directives of the German statutory industrial accident insurance institution
VDA	Association of German Automobile Manufacturers
VDE	Association of German Electrical Engineers
VDG	Association of German Foundry Experts

11 Attachments

11.1 First article inspection report (specimen)

Sender _____

Address _____

Initial Sample Inspection Report VDA

- Initial sampling
- Post-sampling
- New part
- Product change
- Production relocation
- Change of production process
- Extended interruption of production
- New subcontractor
- Product with DmbA
- Production / test plan created
- FMEA conducted
- Test report other (specimen)**

Enclosures		
<input type="checkbox"/> 01 Functional test	<input type="checkbox"/> 07 Proof of test equipm. capability	<input type="checkbox"/> 13 Appearance
<input type="checkbox"/> 02 Dimensional test	<input type="checkbox"/> 08 List of test equipment	<input type="checkbox"/> 14 Certificates
<input type="checkbox"/> 03 Material test	<input type="checkbox"/> 09 EU Data security sheet	<input type="checkbox"/> 15 Manufacturing release
<input type="checkbox"/> 04 Reliability test	<input type="checkbox"/> 10 Tactile impression	<input type="checkbox"/> 16 Substances in purchased parts
<input type="checkbox"/> 05 Proof of process capability	<input type="checkbox"/> 11 Acoustics	<input type="checkbox"/> 17 Other
<input type="checkbox"/> 06 Process flow chart	<input type="checkbox"/> 12 Odor	

Code, Supplier:		Code, Customer:	
Test Report No.:	Version:	Test Report No.:	Version:
Item number:		Item number:	
Drawing number:		Drawing number:	
Version / Date:		Version / Date:	
Change number:		Change number:	
Designation:		Designation:	
Order Call No./ Date:			
Delivery Bill No./ Date:		Incoming No. / Date:	
Delivered quantity:		Unloading place:	
Batch number:			
Sample weight:			

Confirmation of Supplier:	
This is to confirm that the samplings have been made according VDA document 2 paragraph 4.	
Name: Department: Phone / Fax / Email:	Remark:
Date _____ Signature _____	

Customer Decision	Total	According to Enclosure																
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
Released	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Released with conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Refused, post-sampling required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Concession No.:	
for return delivery bill no. / date:	
Name: Department: Phone / Fax / Email:	Remark:
Date _____ Signature _____	
Distr. List:	1 2 3 4 5 6 7 8 9 10 11 12 13 14

11.2 Template for 8D report

Page : 1/2							
Company Name	8D - Report						
1	<div style="display: flex;"> <div style="flex: 1; padding-right: 10px;"> Work team (team leader underlined) </div> <div> Complaint received on : dd.mm.yy Return received on dd.mm.yy Drawing number : </div> </div>						
2	<div style="display: flex;"> <div style="flex: 1; padding-right: 10px;"> Description of the problem </div> <div> Part number (Customer) : : 00471100-01 Part number (Supplier) : 00471100-01 Name of part : From company/Origin: Complaint no. : Date : dd.mm.yy Number of parts : 3.000 </div> </div>						
3	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Immediate measures</td> <td style="width: 20%; padding: 5px;">Responsible</td> <td style="width: 20%; padding: 5px;">Effectiveness</td> <td style="width: 10%; padding: 5px;">Deadline : dd.mm.yy</td> </tr> </table>	Immediate measures	Responsible	Effectiveness	Deadline : dd.mm.yy		
Immediate measures	Responsible	Effectiveness	Deadline : dd.mm.yy				
4	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Analyse of the cause</td> <td style="width: 20%; padding: 5px;">Responsible</td> <td style="width: 20%; padding: 5px;">% causality</td> <td style="width: 10%; padding: 5px;">Deadline : dd.mm.yy</td> </tr> </table>	Analyse of the cause	Responsible	% causality	Deadline : dd.mm.yy		
Analyse of the cause	Responsible	% causality	Deadline : dd.mm.yy				
5	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Proposed measures</td> <td style="width: 20%; padding: 5px;">Evidence</td> <td style="width: 30%; padding: 5px;">Effectiveness</td> </tr> </table>	Proposed measures	Evidence	Effectiveness			
Proposed measures	Evidence	Effectiveness					
6	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> Measures taken / Check of effectiveness Short term Long term </td> <td style="width: 20%; padding: 5px;">Responsible</td> <td style="width: 30%; padding: 5px;">Deadline: dd.mm.yy</td> </tr> <tr> <td colspan="3" style="padding: 5px;"> Updating: <input type="checkbox"/> FMEA <input type="checkbox"/> Technical- / production- / quality- docs </td> </tr> </table>	Measures taken / Check of effectiveness Short term Long term	Responsible	Deadline: dd.mm.yy	Updating: <input type="checkbox"/> FMEA <input type="checkbox"/> Technical- / production- / quality- docs		
Measures taken / Check of effectiveness Short term Long term	Responsible	Deadline: dd.mm.yy					
Updating: <input type="checkbox"/> FMEA <input type="checkbox"/> Technical- / production- / quality- docs							
7	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Measures to avoid repetition of the problem</td> <td style="width: 20%; padding: 5px;">Responsible</td> <td style="width: 30%; padding: 5px;">Deadline : dd.mm.yy</td> </tr> </table>	Measures to avoid repetition of the problem	Responsible	Deadline : dd.mm.yy			
Measures to avoid repetition of the problem	Responsible	Deadline : dd.mm.yy					
8	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Concluding meeting and assessment (effectiveness)</td> <td style="width: 20%; padding: 5px;">Responsible</td> <td style="width: 30%; padding: 5px;">Date : dd.mm.yy</td> </tr> </table>	Concluding meeting and assessment (effectiveness)	Responsible	Date : dd.mm.yy			
Concluding meeting and assessment (effectiveness)	Responsible	Date : dd.mm.yy					
<div style="display: flex; justify-content: space-between;"> Date / Signature (Responsible) Department / phone / e-mail </div>							

11.3 Template for concession

Lieferant: Supplier: Ort: Town: Tel: Fax:		Tolerierungsantrag Waiver / deviation request an to ASM Assembly Systems		Internal Waiver No. Achtung / Attention: Antrag mit ASM AS Entscheidung der Lieferung beilegen! / Please, send this request (including ASM AS response) together with the goods!	
Fax-Adresse (ASM AS-Besteller): Fax-address: (ASM AS-Orderer):	Abt. / Dep.	Name / Name:	Ort / Town:	Tel:	Fax:
ASM AS Bestell-Nr.: ASM AS Order-No.			Zeichnungs-Nr.: Drawing No.:		
Produktbezeichnung.: Product name.:					
Liefermenge/Liefertermin(e): Quantity delivered/ Delivery date:			Menge mit Abweichung: Count with defiation:		
Serien Nr. von bis: Serial number from – to:					
Art der Abweichung / Fehler Kind of deviation / non-conformance					
Maßabweichung <input type="checkbox"/> Dimension fault					
Lage, Form, Oberflächenfehler <input type="checkbox"/> Orientation, shape and surface fault					
Werkstofffehler <input type="checkbox"/> Defect of Material					
Sonstiges <input type="checkbox"/> Miscellaneous					
Beschreibung Ursache und Korrekturmaßnahmen: Description of root cause and corrective measures:			Terminverzögerung: Time delay: nein <input type="checkbox"/> / ja <input type="checkbox"/> bis no yes until		
_____ Datum / Date		_____ Abt. / Dep.		_____ Name / Name	
				_____ Unterschrift / Signature	
Stellungnahme / Entscheidung durch ASM AS Comments / Decision by ASM AS					
Freigabe zur Anlieferung ohne weitere Maßnahmen <input type="checkbox"/> Release for delivery without further measures			Keine Freigabe zur Anlieferung <input type="checkbox"/> No release for delivery		
Freigabe zur Anlieferung nach Durchführung der vorgeschlagenen Abhilfemaßnahmen <input type="checkbox"/> Release for delivery after realization of proposed corrective measures			Begründung: Reason:		
Freigabe zur Anlieferung nach Durchführung der ASM AS-Auflagen <input type="checkbox"/> Release for delivery after realization of ASM AS requirements					
Auflagen: Requirements:			Preisminderung vorbehalten! Price reduction reserved!		
R&D	_____ Datum / Date		_____ Unterschrift / Signature:		
Material Planning / Process Engineering	_____ Datum / Date		_____ Unterschrift / Signature:		
Supplier Quality / Project Leader	_____ Datum / Date		_____ Unterschrift / Signature:		
Verteiler, copies to: R&D / Material Planning, Supplier Quality					
ASM Assembly Systems			Document No. f 0372		Version: 12.01.2011

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11.4 Template for acceptance of these Technical Conditions of Orders and Deliveries

ASM Assembly Systems GmbH & Co. KG
SCM 1 Source

“Technical Conditions of Orders and Deliveries” (TCOD), 01/2012 Edition - Quality Requirements -

We hereby confirm the receipt of and the compliance with the “Technical Conditions of Orders and Deliveries”, 01/2012 Edition, for all our supplies and services to ASM Assembly Systems.

Period of application:

The agreement becomes effective at the time of signature and applies to all supplies and services. After enforcement of this agreement, the agreement shall be binding for all other orders placed after signing the agreement. Amendments or additions to the agreement require the written form of application in order to become binding.

Additional fields of application: **(if relevant, please add)**

Supplier:

Company:
Contact:
Address:
City:
Phone:
Fax:
Email:

Place, date

Signature(s) / Company stamp

PostScript:

The preparation of the "Technical Conditions of Order and Deliveries" (TCOD) is based on contributions from employees from different departments of ASM Assembly Systems.

The TCOD represent no claim of completeness and reflect the available knowledge at the time of preparation.

If changes are incurred to standards or legal provisions, these shall be observed accordingly.

Standards or legal provisions that have not been considered shall nevertheless form the basis for provision of deliveries and supplies. We kindly request our suppliers to notify us of such facts.

The "Technical Conditions of Order and Deliveries" will be revised and published in a new version as soon as an adequate number of change requests have been accumulated. We welcome suggestions from our suppliers.

Issued by:

ASM Assembly Systems GmbH & Co. KG

Rupert-Mayer-Straße 44

D-81379 Munich

Germany

www.siplace.com

Subject to technical changes

Orders to:

ASM Assembly Systems GmbH & Co. KG

ASM AS (Einkauf)

Rupert-Mayer-Strasse 44

81379 München

Germany