

Quality assurance agreement

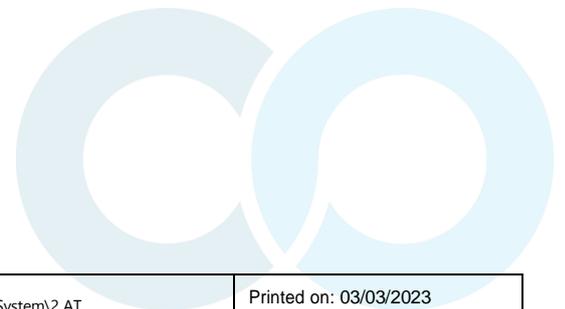
Quality assurance agreement (QAA)

between **BECOM Electronics GmbH**
Technikerstrasse 1
7442 Hochstrass and the related companies

- hereinafter referred to as "Purchaser" -

and **«Firma»**
«Adresse 1 »
«PLZ» «Ort»
«Land oder Region»

- hereinafter referred to as "Supplier" -



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Quality assurance agreement (QAA)

1. Basic provisions

1.1 Regulation

This quality assurance agreement ("QAA" for short) represents a binding regulation of quality assurance measures for the purchase of goods, operating resources or services of BECOM and related companies from the supplier.

All deliveries of goods, operating resources or services from the supplier to BECOM are subject to this QAA. This also includes all activities of the supplier in dealing with complaints, which result from such orders.

The validity of the General terms and conditions of purchase of BECOM is agreed between the parties. These General terms and conditions of purchase can be viewed under (<http://www.becom-group.com>). The application of the supplier's general terms and conditions (e.g. terms of delivery) is excluded.

1.2 Deviating regulations

Regulations that deviate from this, in particular the delivery or other terms and conditions of business of the supplier, are only deemed to have been agreed if BECOM has expressly agreed to them in writing before the respective contract is concluded.

1.3 General

This QAA is a customer-specific requirement from BECOM within the meaning of IATF 16949.

2. Legal basis

2.1 Legal relationship

For the legal relationship between BECOM and the supplier, the following documents apply in the following order:

- a) Offer
- b) The inquiry from BECOM
- c) BECOM Electronics GmbH General Terms and Conditions of Purchase
- d) Non-disclosure agreement
- e) QAA
- f) Separate price agreements concluded between BECOM and the suppliers

In the event of contradictions between the documents, the provision in the last-mentioned document takes precedence. Accordingly, in the event of a contradiction to a), b) shall take precedence over this.

2.2 Passing on the obligations from the QAA

The supplier undertakes to pass on the requirements from this quality assurance agreement in full to its sub-suppliers.

If the supplier purchases production or test equipment, software, services, material or other pre-deliveries from sub-suppliers for the manufacture or quality assurance of the products, the supplier shall include these sub-suppliers contractually in its quality management system or ensure the quality of the pre-deliveries at least in accordance with this QAA. BECOM can request documented evidence from the supplier that the supplier has satisfied itself of the effectiveness of the quality management system at its sub-suppliers.

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3. Implementation of quality assurance

3.1 Quality management system

3.1.1 Quality compliance

The supplier is responsible for maintaining the quality of the products and/or services it supplies. The individual quality requirements result in particular from this QAA and the respective technical documents for the order, in particular from the associated technical specifications, specifically agreed requirements, technical documentation, drawings, terms of delivery, instructions and specifications, our own or third-party forms, samples and applicable legal and regulatory requirements.

3.1.2 Zero error rate

The supplier undertakes to maintain a zero error rate and to improve its processes and procedures continuously in order to increase competitiveness.

3.1.3 management system

The supplier must maintain a certified management system at least complying with the ISO 9001 standard. A copy of the current and valid certificates from an accredited certification company is sent as evidence.

3.1.4 Automotive parts supplier

Automotive parts suppliers commit to develop their system in the direction of IATF 16949.

The respective target development stage must be defined with the responsible buyer.

Depending on the project-related requirements, the supplier must implement the OEM requirement (ISO45001, VW Formula Q, CSR, etc). This will also be determined and coordinated with the responsible buyer.

If a product safety officer (PSCR) is required in the entire supply chain due to the OEM CSR, the supplier must train him/her and identify him/her to BECOM.

3.1.5 Standards

Suppliers who do not have a system based on the above standards undertake to introduce one within a period of time acceptable to both parties. The progress of the introduction is to be communicated to BECOM via an action plan.

Automotive suppliers must absolutely have introduced a QM System compliant with ISO9001. To this end the requirements of IATF 16949 must be maintained (sanctioned interpretation Number 8).

3.1.6 QA officer

The supplier is obliged to appoint a Quality assurance officer and to name him/her to BECOM in writing. Any changes regarding quality assurance officers are also to be communicated.

3.2 Technical documents

3.2.1 Authoritative documents

The supplier must ensure that only valid documents corresponding to the respective contract are used. Specifications, standards and drawings, etc., on which the orders are based, are binding.

The supplier is obliged to request missing or up-to-date documents. Send documents requirements directly to BECOM/Purchasing department, contact person according to the order.

3.2.2 Traceability changes

All technical changes must be traceable by the supplier for a period of 15 years from the date of the change.

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3.2.3 Suggestions for improvements

If the supplier recognises that the execution, technologies or the prescribed test methods or the specified patterns can be replaced by more appropriate, more economical and/or more effective, it undertakes to submit appropriate proposals to BECOM.

3.2.4 Feasibility

The supplier shall check the manufacturability of the product both technically and commercially (quantity, deadline, etc.) on the basis of the technical documents provided to it. This also applies to changes. By submitting the offer, it confirms the manufacturability/feasibility and assumes full responsibility for the quality of product manufacture and delivery. Deviations from the (technical) requirements for the products are only permitted after written approval.

3.2.5 Feasibility study

Suppliers must send BECOM a written feasibility study for every version of any technical document. In the event that the assessment is negative, BECOM must be notified of this within 24 hours and if needed present a plan for measures incl. a timeline.

3.3 Procurement assurance

The supplier undertakes to define and implement suitable measures that ensure its ability to produce and deliver, taking into account the existing quality guidelines. BECOM can demand this evidence if necessary. The supplier must also draft a risk matrix and assess all risks. An emergency plan must be drafted based on this, in order to be able to assure supply demonstrably. The emergency planning describes the potential danger and the safety precautions introduced for this purpose for all of the supplier's operating and production areas. The supplier is responsible for establishing an emergency concept in order to exclude the risks. To this end the following points must specifically be included:

- Failure of means of production
- Interruptions in supply from sub-suppliers
- Flooding, earthquakes, energy supply, pandemics, epidemics, etc.
- Economic effects:
- Employees (specialists, etc.)
- Context of the organisation
- Influential factors of interested parties

3.4 Process documentation, initial samples and requalification

3.4.1 Deviation

The supplier undertakes to inform BECOM immediately in writing of any intended or unintended deviation and/or change in goods, product characteristics, services, materials, manufacturing processes, supplier parts, data sheets, raw material supplies, plants, manufacturing processes, manufacturing locations or other characteristics with regard to the goods or services of the supplier.

These may only be carried out with the prior written consent of BECOM. In the event of deviations and/or demand, BECOM can demand a new initial sampling free of charge.

3.4.2 Written specification

The supplier undertakes to define the manufacturing process, including the supply of raw materials, in writing. Series production begins after BECOM has approved the initial samples and the associated initial sample test report. The manufacturing process approved in this way must be observed.

3.4.3 Initial sample

Initial samples must be manufactured using tools for series production and under standard conditions. Unless otherwise agreed and depending on applicability, Submission level 3 (according to VDA volume 2) or PPAP level 3 applies. The scope of the sampling must be coordinated with BECOM.

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VDA Volume 2 'Assurance of the quality of deliveries' VDA 2, most recent edition

This Sampling procedures and special customer requirements (the entire delivery chain) are to be applied to the sub-suppliers.

An initial sample test report must be sent:

- before the first series delivery of a new product/part
- before series implementation of new/modified tools, material, production processes
- when relocating production facilities
- when changing subcontractors
- if production is suspended for longer than 12 months
- according to a quality-caused delivery block

3.4.4 Initial sample test report

With the initial sample test report according to VDA 2 or PPAP, the supplier proves that the parts meet the requirements. In principle, all characteristics are to be measured by the supplier. Characteristics that cannot be tested by the supplier must either be confirmed by factory test certificate or acceptance test certificate according to EN 10204 or comparable standards or verified by test certificates from accredited testing institutes or measuring bodies.

The test reports are to be attached to the initial samples. A drawing provided with position numbers is also to be included.

3.4.5 Requalification

Annual requalification tests are to be carried out and submitted to BECOM upon request. The scope is to be agreed. A requalification test is understood to mean the repeated dimensional and functional test analogous to the initial sampling according to Section 3.4.3 and Section 3.4.4.

3.4.6 Special characteristics

Special product characteristics are established in the documents. Labelling with SPC, CC, etc.

3.4.7 Agreement of special characteristics

The supplier undertakes to define the special characteristics for its manufacturing processes in a comprehensible manner, to designate and identify them as "special characteristics" and to coordinate them with BECOM. These special features are also to be seen as the starting point for process FMEAs, which are to be made available to BECOM in full upon request.

3.5 Process FMEA

An analysis of potential errors and their consequences (FMEA - Analysis of Failure Modes and Effects) must be carried out. A design FMEA is required for those parts for which the supplier has design responsibility (this includes consumables). A process FMEA is to be carried out for all manufacturing processes from the supplier, even before the start of the production of tools and equipment. All factors that influence the manufacturing process must be taken into account and evaluated. The process - FMEAs must at least take into account the safe manufacturability of the features with special importance. Appropriate precautions for process security must be implemented if weak points are identified. The Process-FMEA is to be carried out according to the current edition of the AIAG & VDA FMEA Handbook.

3.6 Process samples on-site

BECOM is entitled to carry out a production sign-off, "PSO", alone, together with its customers or through third parties assigned by it. With this it will be determined whether the quality assurance measures of the supplier and/or its sub-suppliers are in conformity with the requirements of the specific project.

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Deadlines will be agreed on between the project teams in accord with the requirements.

4. Product or project specific quality agreement

4.1 Validity

This quality assurance agreement replaces each quality assurance agreement with existing quality assessment between the parties.

4.2 Additional agreements

If necessary, an additional product-specific or project-specific QAA is concluded.

4.3 Quality execution

If the quality or design of the goods or services is not specified in the order, the supplier is obliged to deliver them in a quality and design that corresponds to the purpose of the order or, if this purpose is not specified in the order, they must be fit for the purpose for which such goods are normally used.

4.4 Regulations

The delivered goods must comply with all valid safety, legal and applicable official regulations as well as the recognised state of the art.

5. Monitoring and safeguarding of products and processes

When projects are commissioned BECOM will send the APQP checklist. Project progress will be documented regularly and coordinated in the project discussions. The supplier has an obligation to pick up the item.

5.1 Testing concept

The supplier is responsible for defining a testing concept that is suitable for ensuring compliance with the required specification.

5.2 Documentation

The supplier undertakes to monitor and document the manufacturing process using suitable statistical methods in such a way that the process capability of special features is assured and can be verified at any time over the entire production period. Main features, whose process capability is not given, are to be monitored 100%.

If nothing else is defined, the following minimum requirements must be fulfilled:

Short-term capability ≥ 1.67 (min. 50 pcs.)

Long-term capability ≥ 1.33 (min. 200 pcs.)

5.3 Failure to conform with Specifications

If the supplier realizes that agreements made (specifications, deadlines, quantities) cannot be met, the supplier is obliged to inform BECOM of this immediately.

In the interest of finding a solution quickly, the supplier is obliged to disclose all associated data and documents.

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5.4 Records

The supplier shall make records (documentation) of the implementation of its quality assurance measures, in particular about measured values and test results, and keep these and any samples clearly available. BECOM can request these if necessary.

5.5 Identification, traceability and packaging,

5.5.1 Product labelling measures

The supplier ensures the traceability and complete quality verification of all materials, products and manufacturing processes used by means of suitable product labelling measures. On delivery, a label complying with VDA4992 must be applied.

5.5.2 Delivery FIFO

The FIFO ("First In First Out") principle must be applied in production and delivery. If not otherwise defined, different manufacturing batches must not be mixed in one package or otherwise upon delivery.

5.5.3 Traceability

Traceability must be designed in such a way that, in the event of an error, the defective parts/products can be narrowed down clearly and quickly.

5.5.4 Archiving

Quality-relevant data, in particular those that the supplier according to Section 5.2 of the QAA must document must be archived for a period of 15 years from the last series delivery/spare parts delivery to BECOM.

5.5.5 Test certificate

Test certificates for individual deliveries can be agreed if necessary.

5.6 Audit

BECOM is entitled to check itself, together with its customer or through third parties commissioned by it by means of an audit and visit to the supplier whether the quality assurance measures of the supplier or its sub-suppliers comply with the specifications. The audits will be announced to the supplier in compliance with a reasonable period of time.

5.7 Defective products & complaints

5.7.1 Self-monitoring

Self-monitoring of the outgoing goods "ship to stock" is agreed on with the supplier! BECOM will test the delivered goods as a rule for the identity of the good and conformity of the quantity, as well as outwardly noticeable transport and packaging damages. BECOM is not obligated to any additional receiving inspection. BECOM has no obligation to inspect and report according to § 377 UGB. However the obligation of delayed or insufficient inspection as well as delayed reporting of defects is expressly waived. If BECOM detects defects (e.g. in the receiving inspection, during subsequent processing, due to assembly problems, lab tests, customer complaints, or other inspections), the supplier will be notified in writing within a reasonable period with a complete (error message).

5.7.2 Error and defect analysis

The supplier is obliged to start the analysis of the problem as quickly as possible in order to assure substitute deliveries and/or subsequent deliveries with goods free of errors or defects.

In the worst case scenario, the supplier is also obliged to exchange the entire delivery batch for a defect-free batch immediately. The supplier must inspect the products that were subject to the complaints carefully (analysis of defects/causes) and the planned as well as initiated corrective measures in an 8D-report. The effectiveness of measures must be documented for BECOM.

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The condition for the conclusion of a complaint case with BECOM is among others that the original fault is cleared and the measures initiated are demonstrably effective.

8D-reports are only recognised as accepted and concluded if the following content is included:

- Short-term remedial measures (sorting, containment, etc.)
- Cause analysis by means of suitable tools (e.g. 5Why-Analyses or Ishikawa Diagram), separately for:
 - a) "Why did the defect occur"
 - b) "Why was the defect not detected"
- Corrective measures incl. causal connection with the cause analyses that were carried out
- Long-term remedial measures (process and/or system)
- Test of effectiveness incl. documentation

5.7.3 First statement

The supplier's response must include the following:

- Obligation that the next deliveries only contain parts free of defects
- first immediate statement within 24 hours
- a detailed, final 8D report is to be sent in a reasonable time.

Unless otherwise defined, the deadlines specified on the error notification papers apply.

5.7.4 Handling fee & costs

Complaints accepted by the supplier will be charged to the supplier by BECOM with a processing fee of € 250.00. Processing fees billed by the customer will also be billed to the supplier.

In the event that the deadlines listed in Section 5.7.3. for a response are missed, BECOM is entitled to bill the supplier if the complaints are justified of the accumulated costs already before the complaint processing is completed.

If the analysis of the supplier takes a little longer, it can agree the date with BECOM with a written statement.

5.7.5 Remedy supplier

If there is a risk of production downtime at BECOM or its customers as a result of faulty or defective deliveries, the supplier undertakes to take remedial action immediately (replacement deliveries, sorting or reworking, extra shifts, expedited transportation, etc.). In urgent cases, BECOM can, after consultation with the supplier, carry out the repair itself or have it carried out by a third party. The costs accrued through this will be borne entirely by the supplier (incl. all expenses for complaint processing accrued by BECOM).

5.8 Exemption permits (special approval)

5.8.1 Goods and services

The delivered goods or services must correspond exactly to the quality and finish specified in the order.

5.8.2 Special approval

If the supplier is temporarily unable to deliver according to specification due to slight deviations, an application for a special approval can be made.

The application (template BECOM) must be sent to the responsible clerk according to the order in a timely fashion. Deviations can only be approved if the safety, workability, function and durability of the parts are not affected.

In any case, the supplier is obliged to inform BECOM in writing/electronically of the deviations before sending a delivery of non-conforming parts and to obtain written/electronic consent from BECOM.

5.8.3 Application for special approval

The scope of the application is checked by BECOM or commissioned specialist departments or end customers. BECOM shall issue a written statement on this within a reasonable period of time.

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5.8.4 Exceptional approvals

Exceptional approvals must always be in writing to be effective and are limited to a specific number of parts or a specific delivery period.

Approval by BECOM does not release the supplier from its obligation to deliver parts that conform to the specification.

5.8.5 Labelling

At the request of BECOM, the parts must also be labelled separately. The labelling must be carried out according to the template provided by BECOM.

6. Environmental protection with regard to laws, regulations, standards and guidelines

6.1 Circulation

The processes required to manufacture the parts, as well as the materials used, must comply with the applicable legal and safety regulations for restricted, toxic and hazardous substances, as well as with the environmental requirements of the manufacturer and customer country.

The REACH and dual-use regulations as well as the implementation of the RoHS directive must be observed!

Furthermore, the disclosure of any "Conflict Minerals" as identified in the US-American law "Dodd-Frank Act" is obligatory. The law refers to conflict minerals from the Democratic Republic of Congo and neighbouring countries, known as "DRC countries". Tin, tantalum, tungsten and gold compounds are currently affected.

A product life cycle assessment is to be created from the sections raw material procurement, development, manufacture/transport/delivery, use, treatment at the end of the life cycle and final disposal.

6.2 Environmental, occupational and health protection

The supplier is obligated to implement a certified environmental management system according to DIN ISO 14001, a workplace health and safety system according to EN ISO 45001 and an energy management system according to DIN EN ISO 50001 and maintain these for the entire duration of the business relationship and ensure this among the third parties employed by the supplier within the delivery.

The supplier is obliged to use energy, production material and resources as sparingly as possible in production and constantly to reduce the waste of residual materials on the design and process side. Insofar as justifiable for cost, safety, technical and quality reasons, the supplier shall give priority to using production materials that can be recycled after use. The supplier is obliged to recycle any waste produced in an ecologically sound manner. If such recycling is not possible, the supplier is obliged to dispose of it in the most environmentally friendly way possible.

The supplier is obliged to work towards and meet the climate targets set by the European Union.

6.3 Limit values, database entry

Compliance with the legal limit values regarding RoHS or REACH are minimum requirements and must be implemented accordingly. For automotive products, the supplier is obliged to propose an entry in the IMDS database (International Material Data System) on the BECOM ID 29491. According to EU Guideline 1907/2006, suppliers are obligated, when the SvHC limits are exceeded under Article 33(1) of the REACH regulation, to enter the components in the SCIP database of the ECHA and to communicate the reference number to BECOM.

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6.4 Change in legal provisions

Changes in the provisions of law must be complied with by the supplier. Inspection results when the legislator requires must be made accessible. Improvement in terms of recyclability of the products (new materials) are to be communicated. A safety data sheet must be sent with first deliveries, product changes and delivery changes of raw materials, hazardous materials or auxiliary materials (oils, greases, adhesives, casting compounds, base material for surface coatings, additives for dyes and the like).

6.5 Hazardous substances

In principle, the delivered products must not contain any substances or parts that pose an environmental risk (e.g. are hazardous to health) or release hazardous substances under special conditions, or substances that experience has shown can only be disposed of with particular difficulties (hazardous waste, etc.). If the use of such materials or parts is absolutely necessary for BECOM to fulfil the technical requirements, the supplier must inform BECOM of this and obtain express written consent from BECOM before delivery. If this is available, the supplier must send BECOM a fully completed safety data sheet in accordance with CLP: 1272/2008 (in the valid version).

7. Applicable law, place of jurisdiction

7.1 Legal relationship

Austrian law applies exclusively to all legal relationships resulting from this contract, to the exclusion of the UN Sales Convention on the International Sale of Goods as well as the reference norms of international private law.

7.2 Place of jurisdiction

For all disputes arising from this contract, including the question of the valid conclusion and the preliminary and subsequent effects of this contract, the jurisdiction of the competent court for the district of Eisenstadt, Austria is agreed.

8. General

8.1 Withdrawal

In the event of a significant deterioration in the financial situation of the supplier or manufacturer, BECOM is entitled to withdraw from the contracts concluded between the parties for the unfulfilled part of the deliveries.

8.2 Determination

By signing, the supplier confirms that it has read these provisions carefully, that it agrees with their entire content and that it acknowledges the validity and binding nature of these provisions for all orders from and contracts between it and BECOM that are or were concluded on the basis of such orders. The validity of the General terms and conditions of purchase of BECOM is agreed between the parties. The application of the supplier's terms of delivery or general terms and conditions is excluded.

8.3 Receivables

The offsetting of claims or the exercise of a right of retention by the supplier is only permissible with undisputed or legally established claims of the supplier against BECOM.

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8.4 Legal effect of QAA

The quality assurance agreement develops its legal effects when it is signed by the parties and is valid for an unlimited period of time.

8.5 Amendments to the Agreement

Changes to this contract must be made in writing and must be made by authorised signatories. The same applies to the any change in the requirement of written form.

8.6 Additions

Any supplementary contracts on the part of BECOM in the current version remain valid. If there are any contradictions between these and this QAA, the ranking specified under Section 2.1 QAA .

8.7 Language

All declarations of the contracting partners in the execution of this agreement and the resulting cooperation will be issued in German or English (this applies also to Section 5.7 / defective products & complaints and all documents/evidence resulting from them).

8.8 Responsibility

The responsibility of the supplier for the fault-free state of the products delivered by it is not limited by this quality assurance agreement.

9. Definition of terms/Contact person

9.1 Orders

BECOM orders contain an "order code" made up of a 10-digit ARTICLE NUMBER (also known as part number) **and** a 2-digit ISSUE STATUS.

When accepting the order, the supplier checks whether it has the necessary production documents.

9.2 Deadline delay

As soon as the supplier realizes that the originally confirmed date cannot be met, it is obliged to inform the responsible buyer. This must be done separately and not in the form of a new or changed order confirmation. Possible additional costs arising from the delay (line downtime, extra shifts, extra transport, extra purchases...) shall be borne by the supplier.

9.3 Order confirmation

Order confirmations are to be sent in the agreed form.

9.4 Over-delivery

Over-deliveries must be clarified in advance with the responsible buyer (statement of order number, article number, order quantity and delivery quantity). Over-deliveries may only be made with the prior consent of BECOM.

9.5 Under-delivery

Recognised under-deliveries must be clarified in advance with the responsible buyer (statement of order number, article number, order quantity and delivery quantity).

Quality assurance agreement (QAA)

9.6 Error reports

Deviations recognised by BECOM are communicated by means of an error report and the associated error report number.

The procedure from that point on will be clarified with the responsible clerk. The receipt of a returned, defective article from BECOM must be immediately reported in writing to the specific BECOM clerk by the supplier.

A debit note for the agreed value of the goods complained about will be sent separately.

9.7 Replacement order

if the supplier delivers new goods based on a return or a complaint, makes them again or a replacement is sent to BECOM after re-working/sorting, the supplier will be sent a replacement order (the order number will begin with "35..."). Supplier "XY" will bill the good again at the agreed-upon price.

9.8 Annexes in the attachment

For printed circuit board suppliers:

see Annex A - Printed circuit board specific agreements

For drawing parts (injection moulded parts, housing, ...):

see Annex B – Requirements for drawing parts (injection moulded parts, housings ...)

For cable suppliers:

see Annex C – Cable requirements

These annexes are an integral part of the agreement!

10. Annex A - Printed circuit board specific agreements

10.1 Production of circuit boards

If not otherwise defined, the following norms apply:

- IPC-A-600 Class 2
- IPC-6012 Class 2

⇒ the most recent edition/revision is to be used.

10.2 Product labelling of printed circuit boards

On all printed circuit boards, the

- Part number
- Issue status/Revision
- Manufacturer and production date
- UL labelling (if required)

must be shown.

Special features:

- If fields are already provided for this - use them
- Alternative: Alternatively, labelling in solder resist on the SOLDER SIDE or by means of imprinting
- Inclusion in conductive pattern only on request (reason: voltage distances)
- Designation fields can be positive or negative

In the event of uncertainties and/or contradictory specifications, consult and clarify with the ordering party!

Quality assurance agreement (QAA)

10.3 Part number

Always 10 digits

Examples:

Correct

LC5-000---

UBL2445--C

UBL2062--C

~~Incorrect~~

~~**LC5-000**~~

~~UBL2445C~~

~~UBL2062-C~~

10.4 Issue status/Revision

- Always 2 digits
- directly in the area of the part number according to the document overview
- Issue status separated by a slash or in a different position (due to the layout)

Examples:

- LC5-000---/02 or
- LC5-000--- and 02 elsewhere on PCB (layout)

10.5 Manufacturer and production date coded – all variants permitted

10.5.1 Variant 1

Manufacturer logo/abbreviation and YY/WW

10.5.2 Variant 2: with UL labelling

Manufacturer logo/Abbreviation/UL registration number +YY/WW + UL mark

10.5.3 Variant 3: customer-specific specifications for labelling

Other customer-specific specifications are possible and are listed separately in the printed circuit board documents. If anything is unclear, please contact the purchaser!

10.5.4 Variant 4: Supplier is not manufacturer

Taking into account variants 1 to 3, supplier and manufacturer are to be used.

10.6 Packaging

The supplier is responsible for damage-free and flawless delivery. The packaging is to be carried out accordingly.

10.6.1 Individual packaging

Printed circuit boards are sorted (type, date code, manufacturer) and sealed airtight in a bag/foil (vacuum packaging). A drying bag (e.g. silica gel) and a humidity indicator = Humidity Indicator Card according to IPC/JEDEC J-STD-033C and all REACH regulations (must be printed on the indicator card) must be inserted into each sealed circuit board package. It is important to ensure that the drying bags are inserted from the side.

In the case of printed circuit boards that are highly sensitive to moisture, a moisture-proof bag (Moisture Barrier Bag) should be used instead of a normal ESD bag.

Inside a single packing unit there may be at most 25 parts with the same date code and/or production charge. If several different date codes/batches are delivered in one delivery, they must be packed separately, marked accordingly and noted on the delivery note.

Metal core printed boards (IMS printed circuit boards) must be packed in such a way that mutual damaging (scratches, scrapes, ...) is excluded.

Unless otherwise specified, paper separators are to be used.

Quality assurance agreement (QAA)

A uniform packaging direction must be observed within a packaging unit!
All PCB panels must be aligned in the same way in the packaging unit - same position/rotation.

Additional expenses due to non-compliance with the above packaging guidelines will be charged to the supplier.

10.6.2 Overpacking

If no reusable packaging has been agreed for the delivery and the delivery is made in cardboard boxes, the maximum weight of 15kg per package must be observed.

Minimum content of the labelling on the packaging unit:

- 10-digit BECOM item number and 2-digit issue status as per order
- Production batch (date code)
- Number of pieces in packaging unit
- Surface condition (LP-finish)
- possible (reasonable): Order number, your order number, reference to the type of test, etc.
- Labelling according to VDA Label VDA4992

Special features:

- Wrap-around, all-side protection of the packed goods must be ensured.
- Mixed production charges (date codes) inside an external package are allowed.
→ Package date codes AND the matching partial quantities must be stated on the external packaging!
- Packages with enclosed documents (e.g. test reports) are to be identified on the outside of the box.
- No styrofoam flakes

Quality assurance agreement (QAA)

10.7 PCB document overview (SAMPLE)

ABMESSUNG	159 x 108 mm (16,75 x 13,1 mm) im 40 - fach Nutzen		
BASIS MATERIAL	FR4		
MATERIALENDICKE gem. über Lötstopplack und Kupfer	1,6 mm +/- 0,16 mm		
LAGENANZAHL	doppelseitig durchkontaktiert		
STARTKUPFER	17µm		
OBERFLÄCHENBEH.	siehe Bestellbezeichnung		
LÖTSTOPP	fotosensibel UL gelistet Farbe: Grün		
ANZAHL BOHRUNGEN	443 (11 vereinzelt)		
UL - KENNZEICHNUNG	ja	Außenkontur	ritzen
IMPEDANZPRÜFUNG	nein	min. Leiterbahnbreite	>= 0,2 mm
ELEKTR. PRÜFUNG	ja	min. Abstand d. Leiterbahnen	>= 0,2 mm
Fertigung nach	IPC-6012 Kl.2	kleinster Bohrdurchmesser	0,3 mm

ÄNDERUNGEN:	Name																				
	ÄN-Nr.																				
	MROH																				
	Datum	24.01.2012	27.03.2012																		

UNTERLAGENART		Benennung	File-Name	UL-Code	Ext.
FERTIGUNGSZEICHNUNG		UBL1783--A 01--**	/01	00 01	pdf, gbr
CAD-DATEN - FAB/*1			/08		
Blendenteller			/15		
DURCHKONT. DRUCK			/16		
BOHR- NC			/21		
DATEN Info			/22		
DRUCK Lötseite		709-431-001 03 01	/23	00 01	GBL
ORIGINAL Bauteilseite		709-431-001 03 01	/24	00 01	GTL
Lötseite		709-431-001 03 01	/25	00 01	GBS
LÖTSTOPP Bauteilseite		709-431-001 03 01	/26	00 01	GTS
SERVICE Lötseite			/28		
DRUCK Bauteilseite			/29		
Innenlage			/30		
DRUCK Innenlage			/31		
ORIGINAL Innenlage			/32		
Innenlage			/33		
ORIGINAL Innenlage			/34		
Innenlage			/35		
Lötdeckung (Kaptonband) BS			/84.1		
Lötdeckung (Kaptonband) LS			/84.2		
LÖTMITTELDRUCK Bs/*1		709-431-001 03 01	/85	00 01	GTP
KLEBEFKT.DRUCK Ls/*1			/87		
LÖTMITTELDRUCK Ls/*1			/88		

*1 - nicht für LP-Hersteller

AUSGABEZUSTAND	00	01	02	03	04	05	06	07	08	09	10
-----------------------	----	-----------	----	----	----	----	----	----	----	----	----

Der Lieferant ist verpflichtet, entsprechend der Bestellung den Ausgabestatus der Unterlagen gemäß der Unterlagenübersicht zu prüfen und zu verwenden. Bei Unklarheiten Rückfragen an unseren Einkauf.	Datum	120201
	Gez.	DSCHAFFER
	Gepr.	MGLATZ
	Norm	

Benennung:	LP -BR222	Sachnummer:	UBL1783--A
		Unterlagencode:	00
Unterlagenübersicht - LPL		Blatt:	1 Blätter: 2

Here is the current issue status

This must match the issue status on the order!

The column above contains the "unique" correct data for the individual documents!

10.8 What does the supplier always need for order verification

Order with 10-digit item number and 2-digit issue status (i.e. 12 digits are relevant)

- PCB document overview or equivalent document which clearly , references the individual documents (column ABOVE issue status according to the order)
- Part number and issue status must be compared with existing documents, ambiguities must be questioned, missing information or documents must be requested.

Quality assurance agreement (QAA)

10.9 Example order

Address:

Order (number):
from (date):

Date (current):
Editor:
Telephone (processor):

Delivery address:

Delivery terms
Delivery
Payment terms

POS	ARTICLE NUMBER	AMOUNT UNIT	UNIT PRICE EUR	DELIVERY WEEK
-----	----------------	-------------	-------------------	---------------

010	LC5-000--- Edition: 01	80.00 pcs	450.05	WEEK 16/2017
-----	------------------------	-----------	--------	--------------

Text for the part number
Panel definition, if applicable

For THIS edition you must have documents according to the document overview

10.10 Defective printed circuit boards in a panel

If nothing else is specified in the project, the following applies:

- FR4 circuit boards with 1-2 layers: no defective single prints
- IMS, FR4 \geq 4 layers, copper IMS:
 - Number of single prints in use 2-10: one defective single print in the delivery panel permissible
 - Number of single prints in panel >10 : 10% of the single prints in the delivery panel permissible (round up to total unit single prints)
 - Max. 10% of the delivered panels may contain defective single prints.

10.10.1 Requirements for the delivery of panels with defective individual printed circuit boards:

- Panels must be packed separately.
- Packing units affected must be labelled accordingly.
- If not otherwise defined, fiducials (registered marks) for defective single printed circuit boards must be taped over on both sides (top and bottom sides) with a label.
- SPECIAL CASE \rightarrow Defective part labelling on circuit boards with "Global- and Local Ink-Point" – see the following.

10.10.2 Requirements for the label:

- TRANSLUCENT BEHAVIOUR \rightarrow not transparent, not translucent
- TEMPERATURE RESISTANCE \rightarrow must withstand at least 2 reflow soldering processes (lead-free)
- MINIMUM SIZE \rightarrow it must be possible to cover a circular area of \varnothing 4mm
- MATERIAL THICKNESS \rightarrow max. The thickness may not exceed 0.1 mm.
- COLOUR \rightarrow not identical with CB-surface (solder resist)

Quality assurance agreement (QAA)

10.10.3 Positioning of label

- Central over the feature to be taped over
- The label may not stick out over the outer edge of the defective single print.

10.10.4 Defective part labelling on circuit boards with "Global- and Local Ink-Point"

If there is a global and local ink point on the CB panel (specification on the CB label) tape over the defective single circuit boards in the panel as follows:

- a) Tape over the global ink point with a label
- b) Tape over the local ink point of the single print involved with the label.

10.11 Position and shape of the alignment marks

The alignment marks are to be arranged according to the documents!

If there is no separate information on the design of the alignment marks in the documents, the following form applies:

- Design of fiducials:
 - - copper dia.: 1,5 mm
 - - soldermaskfree dia.: 3 mm
 - - copper protection ring dia.: 3,5 mm width:250µm

Positioning of fiducial marks on both sides!

10.12 Contour processing

Unless otherwise specified, the outer contours of the panel to be delivered (single or multiple) must be milled or punched (no scored edges allowed). All other contours are to be executed in accordance with the submitted documents.

10.13 Initial sampling

First deliveries of new products or (if required) product changes are to be sampled.

In the event of a product change/revision change, the change made must be sampled.

The scope of sampling usually includes part samples and associated product-specific test plans and evidence. The number of samples must be coordinated with BECOM in advance.

The purchaser checks the samples and the associated documents and informs the supplier of any necessary corrections for subsequent sampling or gives written approval.

Minimum content of tests for initial sampling

- Dimensional checks (target/actual comparison including drop drawing)
- Electrical testing
- Solderability test/wetting test (dipping method is not accepted)
- Microsection analysis/evaluation
- Material data sheets/IMDS entry (BECOM ID 29491)

If required, special test certificates must be submitted - e.g.:

- Impedance test report
- Statistical documentations (machines/process capabilities)
- UV resistance
- Sulphur free
- Other, article-specific evidence (thickness of dielectric, thermal tests, ...)

Quality assurance agreement (QAA)

10.14 Printed circuit board finish

The printed circuit boards must be solderable for at least 2 reflow processes (Pb-free) within the following storage time (from date code):

- HAL: 12 months
- ChSn: 6 months
- ChNiAu: 12 months

The following deadlines apply to the age of the printed circuit boards at the time of delivery:

- HAL: max. 6 months
- ChSn: max. 3 months
- ChNiAu: max. 6 months

The manufacturing date (printed circuit board date code) serves as a reference.

11. Annex B – Requirements for drawing parts (injection moulded parts, housings ...)

11.1 Part number and issue status of drawing parts

- 10-digit item number and 2-digit issue status (i.e. 12 digits are relevant)
- Parts list header contains the corresponding reference to the documents (see below)
- **Part number and issue status must** be compared with existing documents, ambiguities must be questioned, missing information or documents must be requested or collected.
- Labelling according to VDA Label VDA4992

Quality assurance agreement (QAA)

11.2 Sample of a parts list header (for example EI931029--)

ITEM NUMBER: EI931029-- FRPL. PSU 5 -B3

COMMENT:

Processed by:
Name1 / Name2

DOCUMENT OVERVIEW : ACCORDING TO SNV 0401

EI931029--01-00*01*
EI931029--38-00*00*

Issue states
of the individual

ISSUE STATUS=====

00-01-02=03=04=05=06=07=08=09

PRODUCT CONDITION*****

* 00*01*

*) **Documentation – Code**

- /00 = Document overview
- /01 = Production drawing
- /02 = Construction plan
- /05 = Parts list
- /10 = Assembly plan
- /11 = Dimensional drawing
- /38 = Print templates in general
- /61 = Building regulation (also winding)

ISSUE / CHANGE :

00=310/0126-00 001130 Name*

01=310/0136-01 000220 Name*

11.3 Example order

Address:

Order (number):
from (date):

Date (current):

Editor:

Telephone (processor):

Delivery address:

Delivery terms
Delivery
Payment terms

POS	ARTICLE NUMBER	AMOUNT UNIT	UNIT PRICE EUR	DELIVERY WEEK
010	EI931029--- Issue: 01	100.00 pcs	1.05	WEEK 16/2017

Text for the part number

For THIS edition you must have documents according to the document overview

Quality assurance agreement (QAA)

11.4 Sample of a document header (production drawing)

<input type="checkbox"/>	Prüfmaß	<input type="checkbox"/>	Hilfsmaß	<input type="checkbox"/>	Theor.Maß	<input type="checkbox"/>	Fert.Kontr.Maß	n.SNV 0340		
								Abt.		
								Gez.		
01	310/0136-01							Gepr.		Name (company)
00	310/0126-00							Normg.		
AZ	Änderung	Tag	Name	AZ	Änderung	Tag	Name		Tag	Name
Maßstab	Benennung: -							Sachnr.		
1:1	FRONTPLATTE & BODENBLECH B3-PSU 5							E1931029-01		
	Ersatz f: -			Ersetzt d: -			Blatt: 1 Blätter: 1 A 3			
Handschriftliche Änderungen auf dem Original sind N I C H T zulässig										

Here is the issue status of this production drawing

01 = the document is a production drawing

THIS IS NOT THE ISSUE STATUS

11.5 What does the supplier always need for order verification

- Order with 10-digit item number and 2-digit issue status (i.e. 12 digits are relevant)
- Documents with document header according to the order
- **Part number + Issue status must** be compared with existing documents, ambiguities must be questioned, missing information or documents must be collected.

11.6 Initial sampling

First deliveries of new products or (if required) product changes are to be sampled.
In the event of a product change/revision change, the change made must be sampled.

The scope of sampling usually includes part samples and associated product-specific test plans and evidence.
The number of samples must be coordinated with BECOM in advance.

The purchaser checks the samples and the associated documents and informs the supplier of any necessary corrections for subsequent sampling or gives written approval.

Minimum content of tests for initial sampling

- Dimensional checks (target/actual comparison including drop drawing) – per nest/cavity
- Material data sheets/IMDS entry (BECOM ID 29491)

If indicated in the documents, special test certificates must be submitted - e.g.:

- Cleanliness test according to Specification
- Statistical documentations (machines/process capabilities)
- UV resistance
- X-ray tests (cavities, ...)
- Other, item-specific evidence (surface roughness, evidence of layer thickness,...)

Quality assurance agreement (QAA)

12. Annex C – Cable requirements

12.1 Part number and issue status of cables

- 10-digit item number and 2-digit issue status (i.e. 12 digits are relevant)
- Parts list header contains the corresponding reference to the documents (see below)
- **Part number and issue status must** be compared with existing documents, ambiguities must be questioned, missing information or documents must be requested or collected.
- Labelling according to VDA Label VDA4992

12.2 Sample of a parts list header (for example EI29771---)

TEXT MODULE ARTICLE NUMBER: EI29771---

COMMENT: SL 7392; ULM, INITIAL SAMPLE

Processed by:

Name1 / Name2

DOCUMENT OVERVIEW : ACCORDING TO SNV 0401

EI29771---/ 05 - 00

EI29771---/ 01 - 00

ISSUE STATUS=====

00=01=02=03=04=05=06=07=08=09=10

PRODUCT CONDITION*****

* 00*

ISSUE / CHANGE :

00=485/0003-06 061205 Name *NEW 061206 Name

Issue states
of the individual documents

*) **Documentation – Code**
/00 = Document overview
/01 = Production drawing
/05 = Parts list
/10 = Assembly plan
/11 = Dimensional drawing

12.3 Example order

Address:

Order (number):
from (date):

Date (current):
Editor:
Telephone (processor):

Delivery address:

Delivery terms
Delivery
Payment terms

POS	ARTICLE NUMBER	AMOUNT UNIT	UNIT PRICE EUR	DELIVERY WEEK
010	EI29771--- Issue: 00	100.00 pcs	1.05	WEEK 16/2017

Text for the part number

For THIS edition you must have documents according to the document overview

Quality assurance agreement (QAA)

12.4 Sample of a document header (production drawing)

12.4.1 Example 1: Customer document with BECOM document header (for example EI29771---)

00 485/0003-06	KABEL-SPOTLED 2 / 3 - POLIG Seite 1/1	EI29771--/01
----------------	--	--------------

Here is the issue status of the production drawing

01 = the document is a production drawing
THIS IS NOT the ISSUE STATUS

12.4.2 Example 2 : Customer document with incorporated Becom part number (for example FC81771---)

00 313/0033-07	20071012	ABT.	20071012	Name (company)		
AENDERUNG	TAG	NAME	TAG			
BENENNUNG: KABEL-IC-CARD-MIFAR/ACU -H1				SACH. NR. FC81771--/01		
VERW. FUER:	ERSATZ FUER:	ERSETZT DURCH:		BLATT:1	BLAETTER: 1	A4

Here is the issue status of the production drawing

01 = the document is a production drawing
THIS IS NOT the ISSUE STATUS

12.5 What does the supplier always need for order verification

- Order with 10-digit item number and 2-digit issue status (i.e. 12 digits are relevant)
- Documents with document header according to the order
- **Part number + issue status must** be compared, ambiguities must be questioned, missing information or documents must be collected.

12.6 Initial sampling

First deliveries of new products or (if required) product changes are to be sampled.
In the event of a product change/revision change, the change made must be sampled.

The scope of sampling usually includes part samples and associated product-specific test plans and evidence.
The number of samples must be coordinated with BECOM in advance.

The purchaser checks the samples and the associated documents and informs the supplier of any necessary corrections for subsequent sampling or gives written approval.

Minimum content of tests for initial sampling

- Functional test (short circuit, continuity)
- Pull-off forces (if applicable)
- Dimensional checks (target/actual comparison including drop drawing)
- Pin assignment (if applicable)
- Other, article-specific evidence acc. to requirements on the order, documents or specification

Quality assurance agreement (QAA)

12.7 Cable labelling

Unless otherwise defined, according to documents.

Possible markings:

- Part number Purchaser
- Production batch Supplier (traceability)
- Various supplier data (e.g. name, part number, order number)
- Other purchaser/supplier data (by arrangement)

SUPPLIER

BECOM Electronics GmbH

.....
Name/Department (block letters)

.....
Name/Department (block letters)

.....
Name/Department (block letters)

.....
Name/Department (block letters)

.....
Place, date

.....
Place, date

