



innovative • reliable • global

ELRAD

Electronics d.o.o. Slovenia

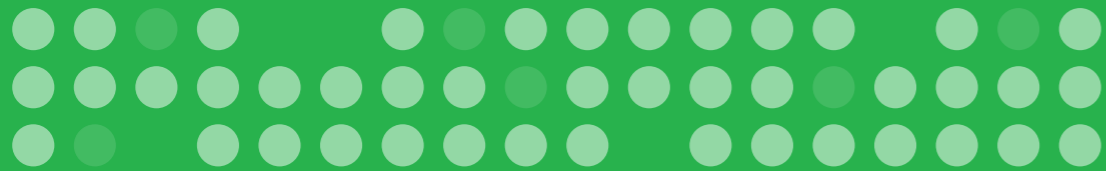
SUPPLIER MANUAL

Quality Assurance Document for Suppliers

Prepared by: Tomaž Ciglar,
Supplier Quality Engineer

Approved by: David Mlakar,
Head of Global Quality

Corporate Standard
200E038
7th issue, 2022-12



1. Introduction

Dear Partners, Service Providers and Suppliers,

A world of continuously changing customer expectations and worldwide competition requires continuous improvement of all products and services as well as business processes and corporate procedures.

Customer satisfaction through quality in all aspects is a crucial success factor for ELRAD and, consequently, for you as our contractor (hereinafter referred to as SUPPLIER), whose products are used in ELRAD's assemblies.

Zero defect(s) quality philosophy for all supplies is an absolute goal that can only be achieved and secured through the common efforts of both ELRAD and its SUPPLIERS. Avoiding defects instead of discovering them and continuous improvements in the entire supply chain are indispensable requirements that we must and want to fulfil with the active help of YOU, our SUPPLIER.

This guideline highlights Elrad's basic requirements for SUPPLIERS and refers to the valid international standards, methods and implementation instructions (e.g. by VDA) which are necessary to achieve common objectives.

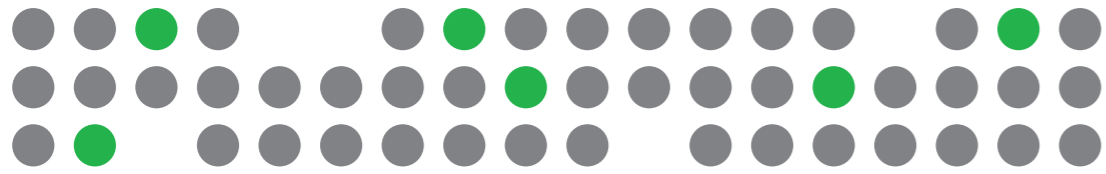
Customer requirements may exceed ELRAD's basic requirements and must be followed as part of our customer satisfaction policy.

APPLICABILITY AND DEFINITION

This guideline is binding for all products and services supplied by a SUPPLIER to ELRAD's locations worldwide or a company associated with ELRAD and is part of the "Framework Supply Agreement for the procurement of manufacturing materials", "ELRAD General Terms of Purchasing" or comes into operation by individual agreements.

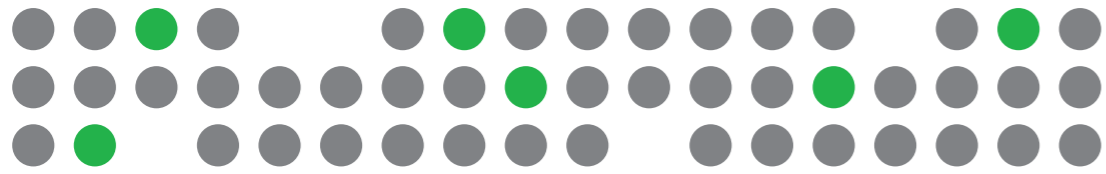
For clarification, in this guideline, the expressions "shall", "must" and "have to" mean "has a duty to".

We look forward to a successful cooperation!



2. Terms and Abbreviations

8D	Systematic problem-solving method (see point 13)
APQP	The component qualification planning defines the necessary requirements for the provision of documents by the supplier at different times.
Initial samples	Manufactured using the final tools and production equipment under series production conditions
FMEA	Failure Mode and Effect Analysis (see point 6)
Pilot production	Manufacture of initial samples at the supplier's plant PRODUCTS Goods and services produced by the ELRAD supplier for ELRAD (see point 4)



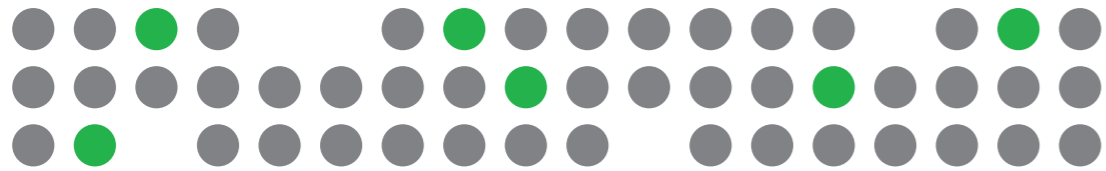
3. APQP (Advanced Product Quality Planning)

The supplier must follow the principle of the APQP methodology (Elrad Milestone Deliverables) for new projects or products.

The scope of APQP is defined by Elrad in collaboration with the supplier. The goal of planning is to identify potential errors that may occur in the production process and to introduce corrective measures in a timely manner.

The supplier must have a professional qualified to prepare documentation and carry out activities in accordance with the requirements of the automotive industry (APQP, PPAP, MSA, SPC, FMEA or VDA equivalents).

All related costs must be included in the price of the products and services.



4. PPAP (Production Part Approval Process)

Prior to the start of series production, the supplier must deliver the PPAP samples from pilot production with the content as follows. The PPAP process must be performed in the following cases:

- new product,
- change of design,
- change of material,
- change in the manufacturing process,
- change of production location,
- cessation of production for more than one year,
- replacement of supplier or source of material.

In case of any changes, the supplier is obliged to inform Elrad and agree on further steps of the PPAP process.

The supplier is fully responsible for the results of measurements on the supplied samples and for any hidden errors and non-conformities that occur later in the use of the product. After the release of deliveries, the supplier is obliged to maintain and improve the quality.

Supplier need to deliver to the customer PPAP physical samples for evaluation, at least 5 sample need to be provided to customer unless otherwise agreed. After reviewing the documentation and the first samples from Pilot production, Elrad makes one of the following decisions:

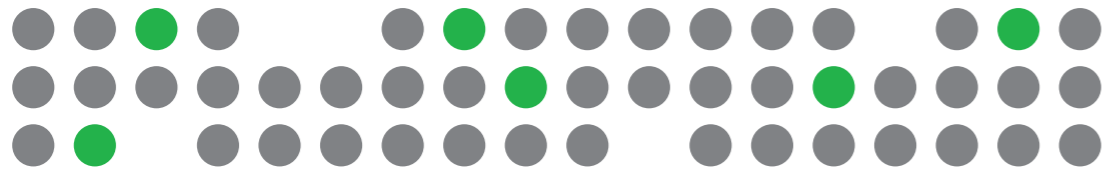
- Approved/released: the supplier fully meets Elrad's requirements and can start custom deliveries,
- Temporarily approved/released: the supplier does not meet all Elrad's requirements, so such a supplier only gets approval for a certain quantity of products or for a limited period of time and has to take the following measures:
 - determine the cause of non-compliance,
 - prepare and submit a plan of corrective measures,
 - re-submit the PPAP for full approval,
- Rejected: the supplier does not meet Elrad's requirements.

The supplier can start regular deliveries only after Elrad's written confirmation of the PPAP procedure (it is recommended to use the PSW form).

After PPAP parts are approved, golden sample need to be created, one sample for each side Elrad and supplier. This applies for: Plastic parts, Wires and wire sets, Metal parts.

PPAP content varies by product group:

- PCBs
- Plastic parts
- Electronic material (MSL level, Shelf life, storage condition)
- Wires
- Metal parts



4.1 PCBs

Generally, PPAP level 3 is required, and the following elements are required to release the series:

- Process Flow Diagrams / Flowcharts
- Design FMEA
- Process FMEA
- Control Plan
- Sample Parts
- Measurement System Analysis Studies (MSA)
- SPC (Statistical Process Analysis)
- COC report (*Certificate of Conformity*)

A COC report is also required for each PCB delivery. This report contains the following documentation:

- UL Flammability Rate
- Base Material type
- Solder Mask type
- Surface Finishing
- Dimensional Measurement Report
- Hole Size Measurement Report
- Board Thickness Measurement Report
- Solderability Test Report
- Report of Electric Test
- Micro-section Inspection Report
- Cross-section sample (*physically delivered*)
- Micro-section of V-cut
- Thermal Test Report (*if extra required*)
- Ionic Containment Test Report (*if extra required*)
- CAF test (*if extra required*)

4.2 Plastic parts

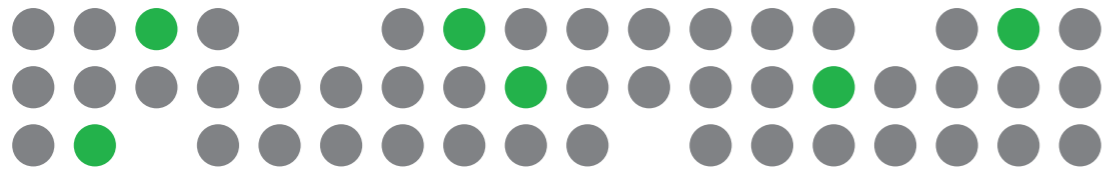
Generally, PPAP level 3 is required, and the following elements are required to release the series:

- Process Flow Diagrams / Flowcharts
- Process FMEA
- Control Plan
- Sample pieces produced under serial conditions
- Measurement System Analysis Studies (MSA)
- SPC (Statistical Process Analysis)
- Measurement report
- COC granules
- Part Submission Warrant (PSW)

4.3 Electronic material (distributors)

Generally, PPAP level 2 is required. ELRAD does not release series production for this material. The following documentation is required for the quotation and sample pieces.

- Datasheet components
- Shelf life and storage conditions
- Specified MSL level, if required
- MPN
- Luminance class, if required



4.4 Wires and wire sets

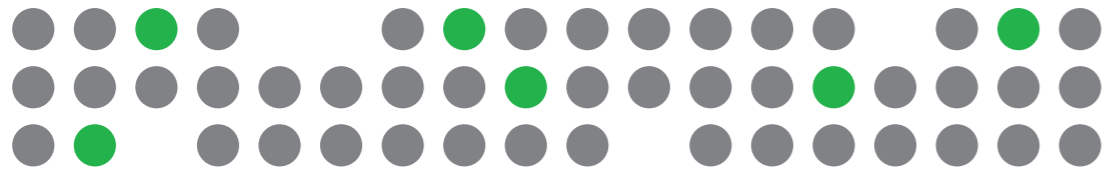
Generally, PPAP level 3 is required, and the following elements are required to release the series:

- Process Flow Diagrams / Flowcharts
- Process FMEA
- Control Plan
- Sample pieces produced under serial conditions
- Measurement System Analysis Studies (MSA)
- SPC (Statistical Process Analysis)
- Measurement report
- COC wires
- Rohs, Reach certifications
- Solder paste and flux datasheet
- Part Submission Warrant (PSW)

4.5 Metal parts

Generally, PPAP level 3 is required, and the following elements are required to release the series:

- Process Flow Diagrams / Flowcharts
- Process FMEA
- Control Plan
- Sample pieces produced under serial conditions
- Measurement System Analysis Studies (MSA)
- SPC (Statistical Process Analysis)
- Measurement report
- COC of base material
- Galvanization report
- Rohs, Reach certifications
- Solder paste and flux datasheet
- Part Submission Warrant (PSW)



5. SPC (Statistical Process Analysis)

We study the ability and stability of a process for one reason only: to prevent the production of unsuitable products. Statistical study alone cannot reduce our problems and waste, but it certainly helps us determine the cause and take timely action.

The study of the ability and stability of a process or machine is thus based on data obtained or collected from production, which we direct to the future of the operation of the studied process or machine.

The ability is shown with one of the indexes:

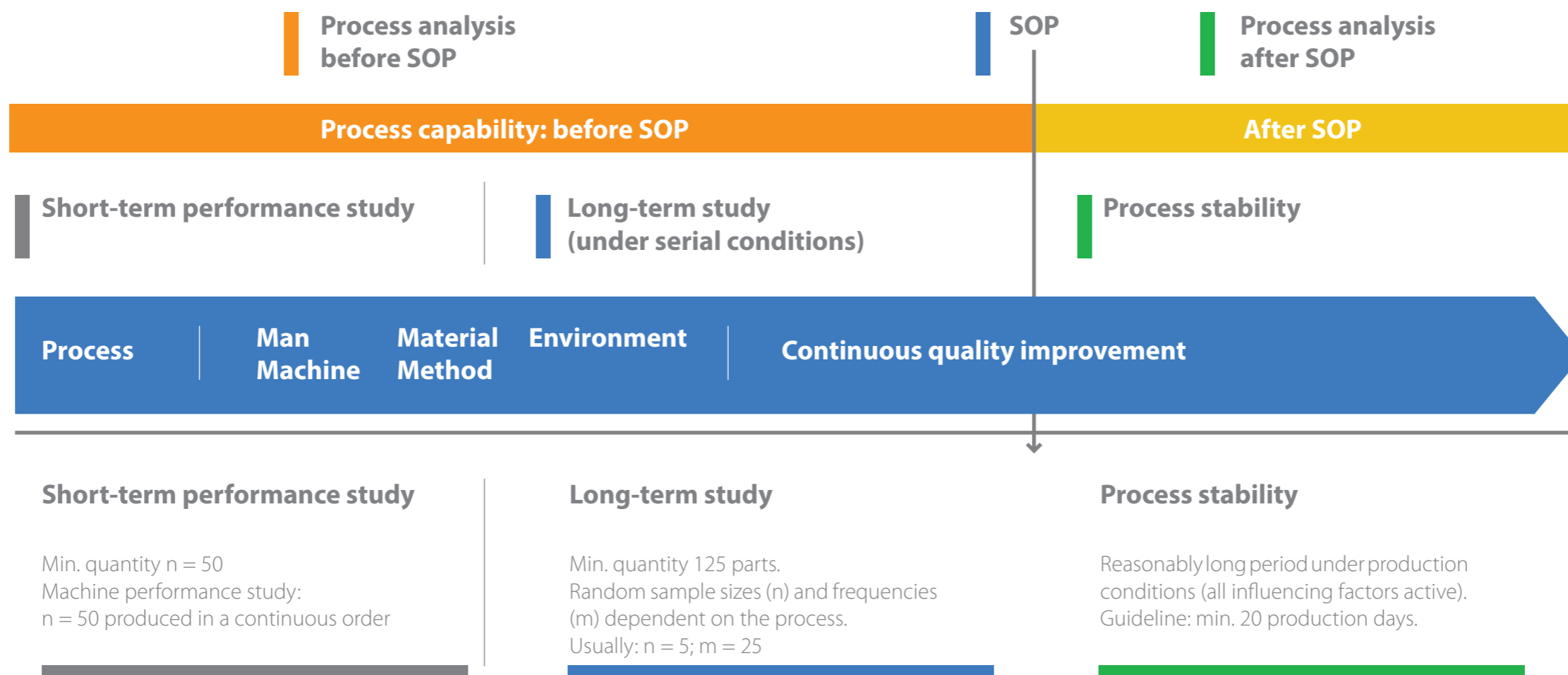
- Cpk (long-term process capability): an index to show the scattering of a process against tolerance, considering the natural variation of the process. Sigma is calculated based on variations within subgroups. The index can only be used if the process is stable (measurements are within control limits) and we have measurement results based on series sampling.
- Ppk (long-term process capability): sigma calculation based on all samples. The measurement results are obtained based on random samples from the series.

Unless otherwise required, the process capability shall be deemed to be proven and assures adequate quality in the following cases:

Characteristic	Sampling	Serial production
Security	Pm/Pmk \geq 2.00	Cp/Cpk \geq 1.67
Functional (important)	Pm/Pmk \geq 1.67	Cp/Cpk \geq 1.33



5.1 Type of Capability Studies





Type of Capability Study

Short-term performance study

Short-term performance study with min. $n = 50$ parts after determining frame conditions.

Specific short-term study:

Machine performance study $n = 50$ in a continuous order produced parts so that only the influence of the machine has an effect.

Long-term study (under serial conditions)

Long-term study based on m sample extraction (for example, of $n = 5$ parts) with a minimum $m \cdot n = 125$ parts, to determine process capability over a short time, e.g. to cover a pre-production run, but under serial conditions.

Note:

According to AIAG (PPAP), at least 100 values ($m \cdot n$) and at least 25 samples (s) are required.

Process stability

Long-term study based on sample extraction to determine process capability over a longer period during production (as a guideline of min. 20 days of production). All the factors influencing the process must be active during the study period.

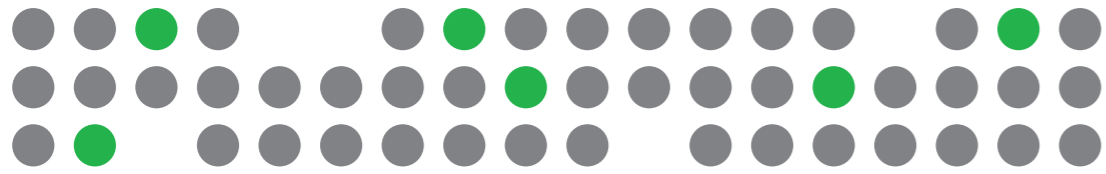
Calculation of the process capability index (C_p/C_{pk}) or the process performance index (P_p/P_{pk}).

Capability indices (compliant with DIN ISO 22514)

Label	Standard requirement	Meaning	Differentiation criterion
P_m, P_{mk}^*	≥ 1.67	Machine performance index	Short-term performance study
C_p, C_{pk}	≥ 1.33	Process capability index	Long-term capability, stable process
P_p, P_{pk}	≥ 1.33	Process performance index	Long-term capability, unstable process

Note:

The calculations of the capability indices are the same. The type of capability is determined by the procedure, such as sample size, number of values, and so on. Attention! The definitions of P_p/P_{pk} and C_p/C_{pk} are sometimes used differently.



6. FMEA (Failure Mode and Effect Analysis)

FMEA – Failure Mode and Effect Analysis

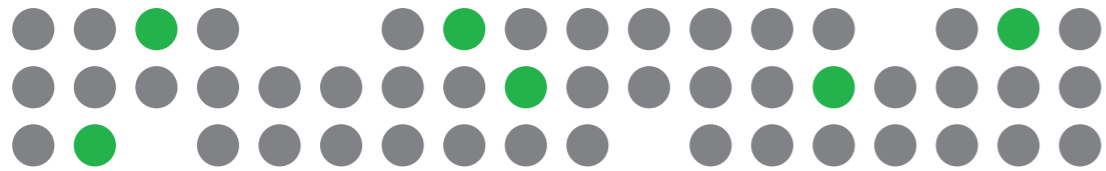
The supplier must produce a process FMEA (PFMEA) for all parts that are subject to regular deliveries to Elrad. Where the supplier is also responsible for product design, he must prepare a design FMEA (DFMEA).

The FMEA can be designed for part families where the same processes, common tools, and the same control plan are used. Families must be clearly identified in a list.

At the request of Elrad, the supplier shall provide copies of the FMEA documents for revision to Elrad's supplier development engineer – SQE (Supplier Quality Engineer).

A copy must be written in the supplier's local language and English. If the document is considered confidential, the supplier can show only certain sections or provide technical support to the SQE in interpreting the FMEA, without providing a complete copy of the FMEA.

A letter stating confidential information is included in part of the PPAP procedure certificate. The supplier must use the principles and assessment following the latest applicable AIAG recommendations (FMEA manual) when preparing the FMEA unless otherwise agreed with the SEP.



7. MSA (Measurement System Analysis)

Measurement System Analysis – MSA is a set of techniques that allows us to assess the errors contributed by a measurement system. These errors can have a decisive impact on the management of process parameters and product characteristics.

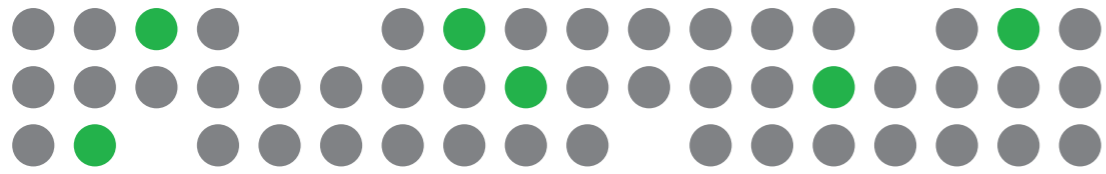
Expert MSA is essential in the production of more demanding products that require a high index of process capability. We are increasingly making decisions based on measured values, so we need to know how good the measurements are.

The supplier must perform the assessment to analyse the following measurement systems:

- Variable measuring system (variable characteristics are all those whose value can be expressed numerically) – including, but not limited to, moving gauges, micrometres, measuring clocks and altimeters.
- Attributive measuring system (attributive or descriptive characteristics) – including, but not limited to calibres, GO/NO-GO control devices.
- Complex measuring system (measuring systems in which it is not possible to measure the same piece several times – demolition and non-repeatable measuring systems).

Measuring system acceptance criteria:

- Type 1: C_g and $C_{gk} \geq 1.33$
- Type 2: $R\&R \leq 10\%$; $ndc \geq 5$
- Type 3: $R \leq 10\%$; $ndc \geq 5$



8. Special Characteristics

Special characteristics must be provided and managed in such a way that compliance with the requirements is always ensured. They may be related to a product or process. Special characteristics must be clearly marked on all technical documents without exception and must be verifiable.

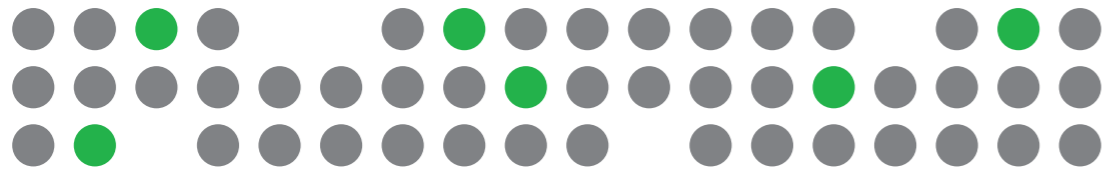
Special characteristics are:

- <S>: Safety Characteristics that can infringe on safety regulations.
- <CC>: Critical Characteristics that can infringe on safety or government regulations.
- <SC>: Significant Characteristics that can infringe on form, fit and functions or cause rework and scrap or may severely affect subsequent operations.
- <IC>: Inspection Characteristics serve primarily to control production processes.

These characteristics are defined in the product requirements and/or the accompanying technical documentation and are specially marked. The supplier is obliged to regularly monitor the Special characteristics and keep the records for 15 years.

Special characteristics examples:

- All geometry-related dimensions
- Function-relevant information, such as watertightness, performance, torque, noise, etc.
- Information on decorative properties
- Information on surface properties
- Shape and positional tolerances
- Information on heat treatment and material
- Information on tothing, threading, etc.
- Surface treatment information
- Information on welding
- Information on workpiece edges
- Specifications relating to the flammability/combustibility of materials
- Heat resistance, impact resistance and flexural strength of materials
- Characteristics related to the process, e.g. pull/push/shear forces, starting power



9. Waiver (Deviation approval)

If the supplier discovers derogations in the characteristics or reliability of the products in relation to the agreed requirements, the supplier is obliged to immediately inform Elrad and proceed to eliminate the derogations.

The supplier may supply the product with a derogation after approval by Elrad. The supplier must complete the Request for Deviation application. Released products must be specially labelled by the supplier with a permanent label to mark the consignment with approved products.

Each packing unit must be marked.



10. PQA Measurement Report (Preventive Quality Assurance)

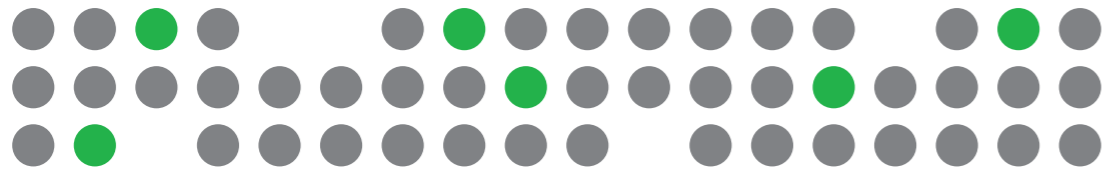
The supplier must send a PQA Measurement Report with each delivery or for each series.

The purpose of the PQA Measurement Report is to verify critical characteristics at the final control of the manufacturer's process. Critical characteristics are determined by the customer. A PQA Report must be attached to each delivery unless otherwise agreed with the customer: send via email or upload the documentation to the server. The PQA Report must clearly indicate the series so that traceability is guaranteed.

Material groups where sending a PQA Measurement Report is mandatory:

- PCBs (COC is considered as a PQA report here, which suppliers send with each delivery).
- Plastic parts: housings, rotary knobs, housing with contacts, plastic knobs, and seals. Various connectors are excluded as catalogue material.
- Metal parts: contacts, stamped parts, nuts, washers and similar catalogue material are excluded.
- Guides: individual guides and guide sets.

The supplier is obliged to ensure the quality of the purchased material and is also responsible for all consequences arising from the poor quality of the material. The customer's input control only sample checks the quality of the material and is not responsible for later defects that occur during the production process or at the end user.



11. Supplier Request for Engineering Change/Supplier Part Change Notification (SPCN)

Elrad expects suppliers to continuously improve quality and reliability in order to reduce costs and thus lower prices. Therefore, the supplier may propose a modification to the product he supplies to Elrad at least 4 months before the intended introduction of the modification. In the annex to the proposal, the supplier indicates the results of all the tests he has carried out with the modified products.

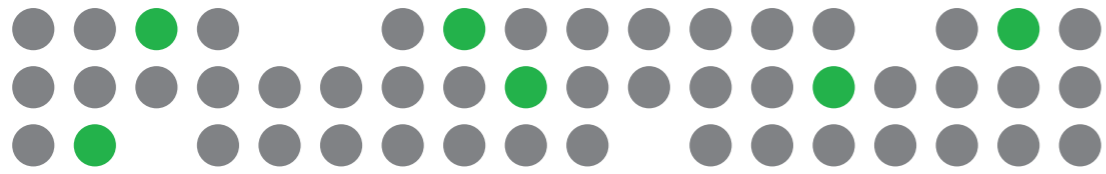
Elrad examines the proposal and communicates the decision to the supplier. Any modifications without the prior approval of Elrad are not acceptable.

Prior to any supplier change being implemented, a clear notification about the change must be submitted to Elrad's Purchasing department (pcn@elrad-int.si) for authorization 180 days before the planned first shipping date of the product (see table below).

SPCN includes but is not limited to changes in manufacturing location (new additions, closures, change of ownership, etc.), change of sub-suppliers, change in manufacturing equipment/process, design change, change of measurement techniques or devices and change in material.

The following is the minimum content of the SPCN:

- PCN tracking number
- Product Identification (e.g. affected supplier's part number(s), affected product lines including specific packaging types, product family)
- Elrad's part number(s)
- Detailed description of proposed change(s)
- Method, if applicable, of identifying the changed product
- Reason for change(s)
- Anticipated (positive and negative) impact on fit form, function, quality, or reliability
- Proposed first shipping date for changed products
- Supplier's Qualification plan schedule and/or results, where applicable and agreed upon with the customer
- Date when qualification samples are available



Type of change	Descriptions of change	Official SPCN to send to Elrad
Change of manufacturing site or manufacturing line	Change or adding of the manufacture line	6 months prior to the change
	Close factory / change of site	12 months prior to the change
Change of manufacturing site or manufacturing line	Change of electrical characteristic	6 months prior to the change
	Change of mechanical characteristic	
	Change of thermal characteristic	
	Change of safety characteristic	
	Change of design	
	Change of material	
Product discontinuity	Change of storage conditions	12 months prior to the change
	Product discontinuity	



12. Product Modifications

Product modifications by Elrad

In case of product modifications, Elrad will send a request to the supplier together with all the necessary technical documentation.

The supplier checks the feasibility of the modification and prepares a quotation, which must include a detailed inventory of costs, a schedule of activities and an overview of stocks. Elrad will inform the supplier of the planned sampling date and the introduction of the modification.

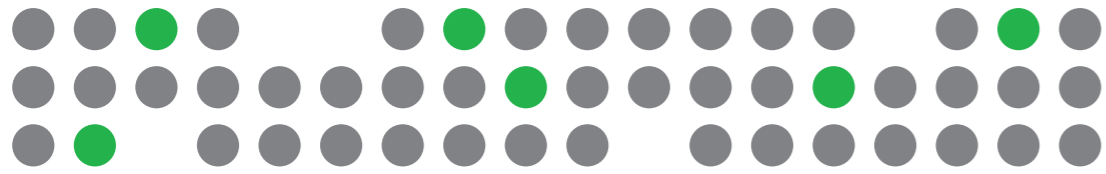
The costs of the modification, unusable stocks and any price change are subject to agreement between the supplier and Elrad.

Modifications proposals by the supplier

Elrad expects suppliers to continuously improve quality and reliability in order to reduce costs and thus lower prices.

Therefore, the supplier may propose a modification to the product he supplies to Elrad at least 4 months before the intended introduction of the modification. In the annex to the proposal, the supplier indicates the results of all the tests he has carried out with the modified products. Elrad examines the proposal and communicates the decision to the supplier.

Any modifications without the prior approval of Elrad are not acceptable.



13. Non-Compliance Management (SNCR)

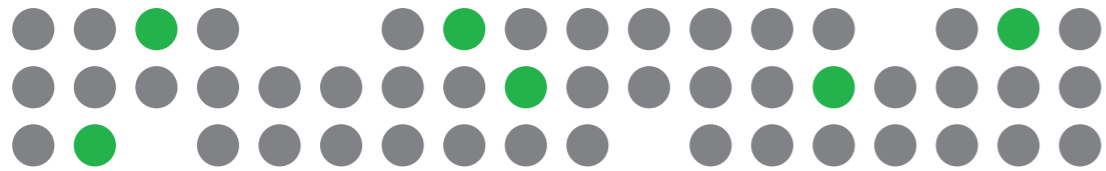
In case of non-compliance, the customer initiates a complaint procedure. The supplier is obliged to immediately start resolving the problem and notify corrective measures within the agreed time limit. In the event of a blockage of the entire stock at the customer, the supplier is obliged to replace the material as soon as possible.

The supplier is obliged to send the customer an 8D report if requested.

Corrective measures must be clearly documented and evident from the report. Pictures must be attached if the measures are visible (tool repair, tool optimization, etc.).

The customer must be provided with information on when the corrective measures take effect and with which delivery the customer will receive a series of materials where the measures have been implemented.

Complaints must be entered into the system at the supplier and all responsible persons must be notified. If there is an error in the production process, this non-conformity must be recorded in the error catalogue.



13.1 Response to SNCR: Timing requirements

The supplier shall use the 8D problem-solving method and associated tools and respond to the SNCR if requested by the customer.

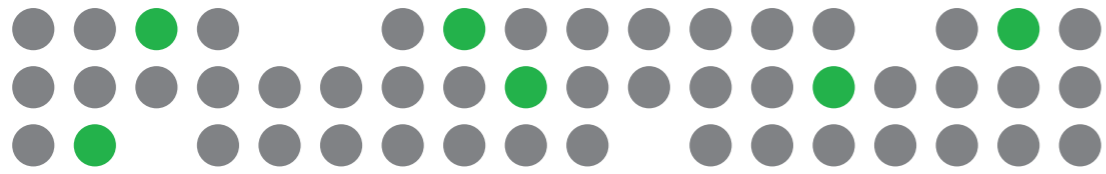
- Within 24 hours – The supplier must acknowledge the receipt of the SNCR by email and initiate containment and the corrective action process.
- Within 2 working days – The supplier must complete the first 3 steps (D1 to D3 included), which define the containment plan and interim actions in place until action plans have been defined.

If Elrad needs ready-for-use parts immediately, a securing sorting of the Elrad stock might be necessary and initiated either by Elrad at the Supplier's expense, or by the Supplier, who sends someone to Elrad to do the sorting.

The Supplier must decide who will be responsible for the secure sorting within 24 hours of submission. After this time, if no return from the Supplier, Elrad will organize the sorting at Supplier cost.

- Within 10 working days – The Supplier must complete the first 5 steps (D1 to D5 included) which includes:
 - a) the root cause(s) for non-detection and
 - b) the root cause(s) for occurrence corrective actions identified and planned for occurrence and non-detection root causes. If permanent corrective action is not implemented, interim containment action must be implemented, approved by Elrad and kept in place until the permanent corrective action plan is completed. The date of D5 receipt by Elrad will be part of the Supplier quality performance.
- Within 20 working days – Unless otherwise agreed with Elrad, the 8D report is completed.

The efficiency of actions defined in D5 has been verified. Lessons learned have been formalized in the PFMEA. Any relevant document linked to the process / product has been updated. Actions have been standardized to similar processes and products.



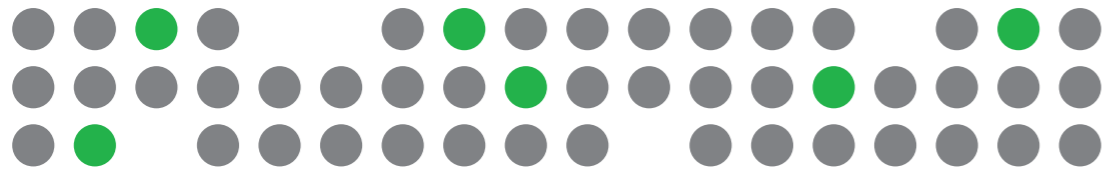
14. Reimbursement of Costs

In the event of established and confirmed material defects, the supplier is obliged to reimburse all costs incurred in this case. Upon receipt of the material, the customer sample checks the material and is not responsible for later defects that occur during the production process or at the end user, unless it is established that the customer directly affected the quality of the material in the production process.

The supplier is also charged the costs of the complaint procedure, which are agreed in the general contract with the supplier.

Examples where additional costs may be incurred:

- Rejection of material at receipt: value of material or replacement quantity.
- Detection of an error in the production process: stopping production, eliminating bad pieces and sorting.
- Detection of a defect on an already installed assembly: stopping production, eliminating bad pieces, sorting, repairs and value of finished products.
- Detection of a defect at the end customer or on the market: cessation of production at the end customer, eliminating bad pieces, sorting, repairs, value of finished products and logistics costs.



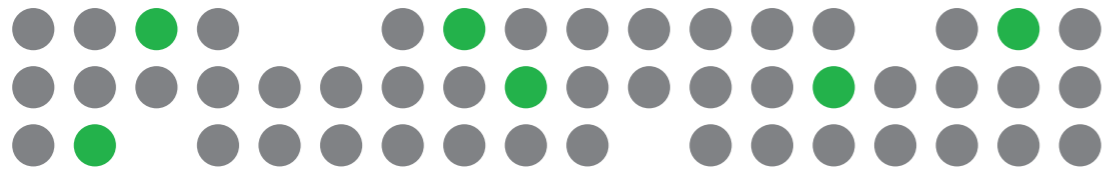
15. Monitoring Suppliers

Elrad monitors suppliers on a monthly basis, the main indicators being:

- Number of complaints
- PPM value
- OTD – on-time delivery
- OTQ – on-time quantity

Elrad informs suppliers on a quarterly basis by sending them reports on the results achieved.

In case of deviations from the agreed goals, the supplier is obliged to prepare an action plan to improve the results.

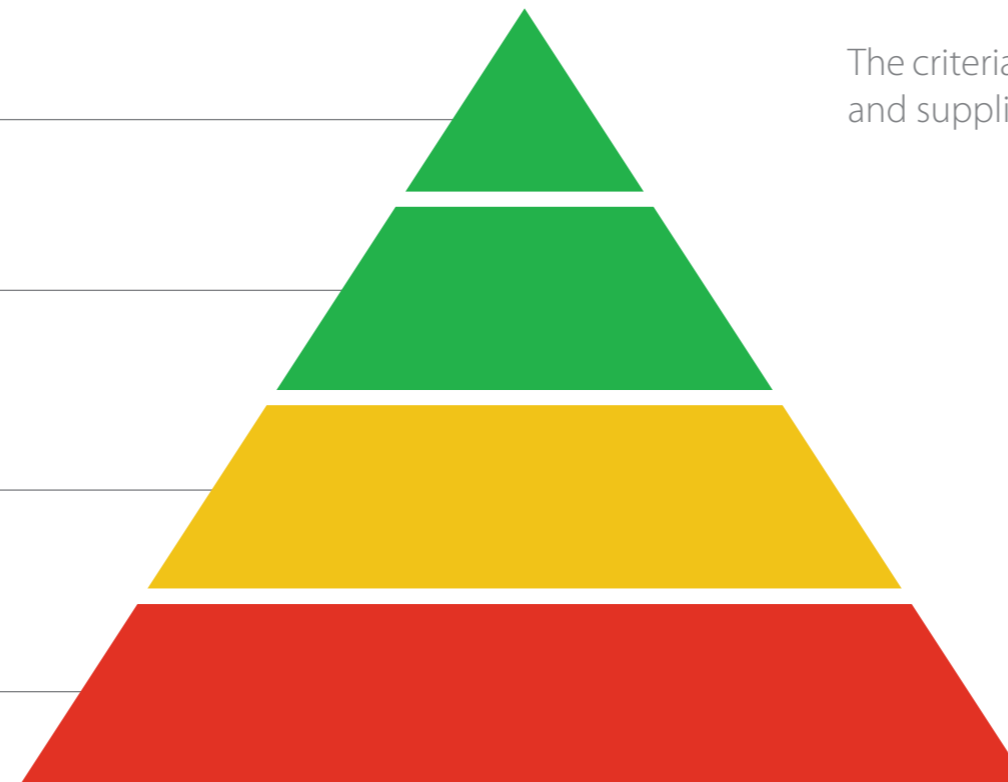


16. Evaluation and Classification of Suppliers

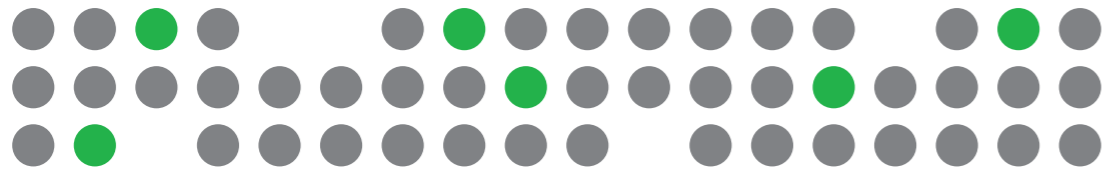
16.1 Classification of suppliers into status groups

Suppliers are classified into 4 status groups:

- PREFERRED**
Supplier/*customer demanded
- MAIN**
Supplier/*customer demanded
- Supplier W/O**
New business/*customer demanded
- PHASE OUT**
Supplier



The criteria for classification are annual turnover and supplier evaluation.



16.2 Evaluation of suppliers

In accordance with the company's policy and the requirements of the ISO 9001 standard, an ongoing evaluation of the reliability of suppliers is required. Suppliers are monitored on an ongoing basis, and every 6 months an evaluation of an individual supplier is compiled, which is then forwarded to the supplier. Each supplier can reach max. 100 points; representing 100%.

Suppliers from the preferred supplier group are evaluated. Criteria which the overall evaluation of the supplier comprises:

- QM: Quality of delivered products; 60 points possible
- SC: OTD, Timeliness of product deliveries; 20 points possible
- PU: Competitiveness of the supplier; 20 points possible

Suppliers are classified into three classes (A, B and C) based on the number of points collected.

Supplier _ Class:	Number of points:
Supplier A	85 - 100
Supplier B	70 - 84
Supplier C	Less than 70

If the supplier has been evaluated with a grade C, the action plan is mandatory. In case of evaluation with a grade B, next step for improvement need to be discuss with ELRAD. Action plan need to be provided within 6 weeks at the latest, with which the deviations that affected the evaluation will be corrected.

Downgrading rule, supplier is downgraded from score A to B, if he does not achieve a sufficient number of points in each evaluation group: QS minimum 50 points, SC minimum 10 points, PU minimum 10 points.

16.2.1 QM: Quality of delivered products

- PPM Scale

CATALOGUE PARTS		CUSTOM-MADE PARTS	
Range:	Points:	Range:	Points:
0-20	20	0-200	20
21-100	15	201-300	15
101-250	10	301-500	10
251-500	5	501-1000	5
Over 500	0	Over 1000	0

- Number of complaints

CATALOGUE PARTS		CUSTOM-MADE PARTS	
Range:	Points:	Range:	Points:
0	30	0-1	30
1-2	25	2-4	25
3-4	20	5-10	20
5	15	11-15	15
Over 5	0	Over 15	0

- Line stop in the production process due to poor material quality

Range:	Points:
0	5
1	3
2	1
Over 2	0

- Supplier corrective measures (2 points)
- Supplier has implemented ISO 9001 certification (1 point)
- Supplier has implemented ISO 14001 certification (1 point)
- Supplier has implemented ISO 45001 certification (1 point)



16.2.2 SC: OTD, DIF, Payment term, Soft fact

- Average on-time Delivery (OTD)

OTD in %	Points:
95% or more	10
90–94%	8
85–89%	5
Less than 84%	0

- Delivery in full in measured period (DIF)

DIF in %	Points:
93% or more	10
82–92%	5
Less than 81%	0

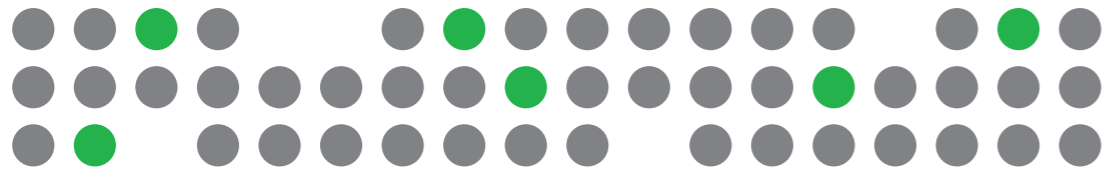
16.2.3 PU : Supplier competitiveness

- Payment term

In days	Points:
120 or more	9
90-119	8
60-89	5
30-59	3
Less than 30	0

- Sconto (1 point)
- Soft fact

Department	Points:
Strategical Purchasing	max. 4
Technical Purchasing	max. 3
Operative Purchasing	max. 3
Total max.	10



17. SQIP (Supplier Quality Improvement Program)

In the event of failure to achieve the agreed quality objectives, Elrad may nominate a supplier to the SQIP program.

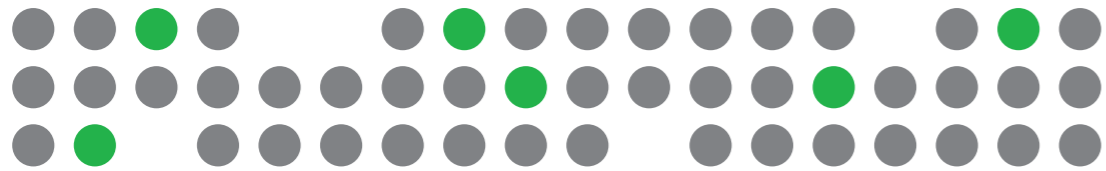
SUPPLIER ESCALATION PROCESS

In case of recurring quality or logistics problems (e.g. failure to achieve agreed objectives, failure to resolve complaints, etc.) the Supplier escalation process is initiated.

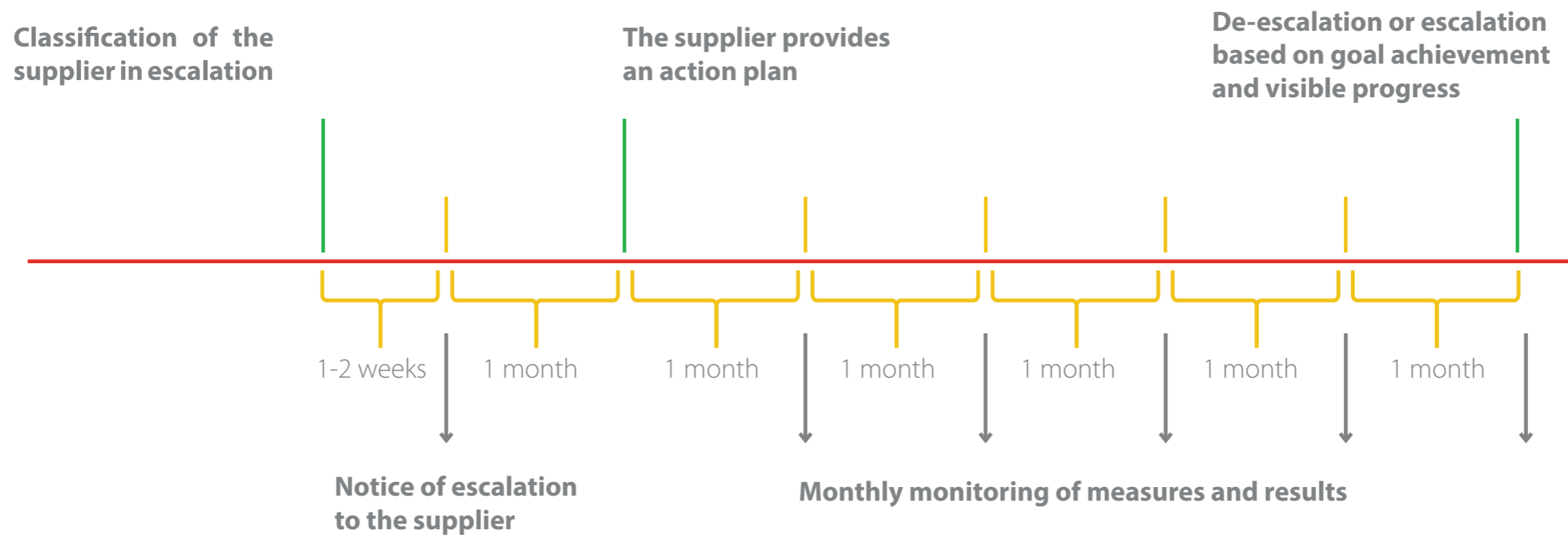
The aim of the process is that the supplier takes appropriate measures to ensure that the delivered products and materials meet the requirements. Depending on the duration and severity of the problem(s), the supplier is classified into one of two levels of escalation.

Basic escalation process:

	Process step	Method	Responsible
Process	Cause analysis	Fishbone / 5x why?	Supplier
	Definition of measures	Action plan	Supplier
	Confirmation of measures	Review of the action plan	Elrad
	Implementation of measures	Action plan	Supplier
	Monitoring of measures	Action plan (monthly)	Elrad
	Monitoring results	Results report (monthly)	Elrad
	Staging or de-escalation	Evaluation of results	Elrad



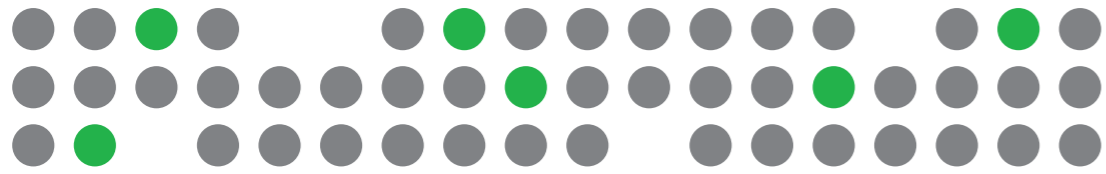
Timeline of the escalation process:



Supplier development: is the level of continuous improvement of the supplier, which is carried out based on quarterly results reports in order to achieve the agreed goals. The supplier forwards the action plan to Elrad.

Escalation level 1: is the level of escalation in which the supplier is classified on the basis of major deviations from the agreed targets. This level has no restrictions on business. The supplier prepares an action plan, approved and monitored by Elrad, to ensure that it is appropriate and effective. The supplier is responsible for implementing the measures and must report monthly to Elrad on progress through an escalation meeting.

Escalation level 2: If the requirements of Escalation level 1 are not met, the supplier is classified into Escalation level 2. This means that the supplier is temporarily banned from new inquiries. At this level, the problems are analysed by the Elrad team at the supplier's location. The supplier must be willing to support all activities. The supplier's management is committed to ensuring that the agreed measures are implemented. The implementation and effectiveness of the measures are monitored based on monthly reviews. The level of escalation ends with de-escalation. If the project is not successful to the fault of the supplier, Elrad may take further action.



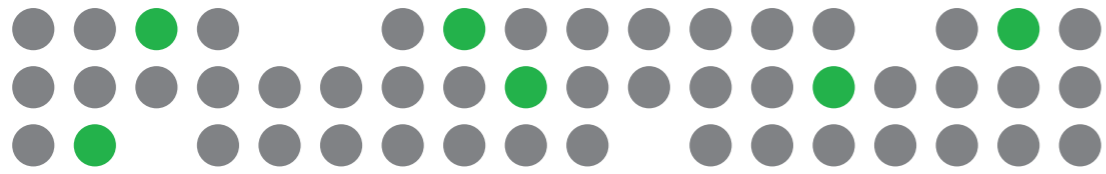
18. Supplier Audit

Elrad conducts supplier audits according to a regular annual audit plan with an emphasis on location release and process release audits.

- Process release audits are performed according to the VDA 6.3 process assessment questionnaire.
- Release of new suppliers and location release audits are performed on basis of the potential analysis P1 from VDA 6.3.

Incentive where the supplier audit may be carried out:

- In case of greater escalation and quality issues
- In case of the production process release
- In the event of a change of site production and/or other major process changes



19. Traceability

The manufacturer or supplier must ensure the traceability process at the level that it is possible to connect individual batches with the process parameters and the batches of the material used.

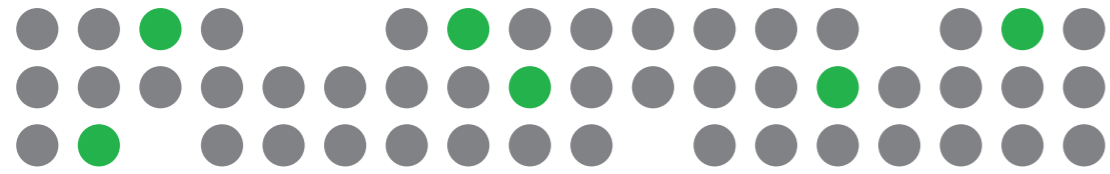
20. Labelling, Packaging

The labelling must meet at least the following basic conditions:

- Item code
- Item name
- Quantity of the packing unit
- Manufacturing date
- Batch of material (LOT, production order, etc.)

This information must be indicated on each packaging.

Packing is carried out in a pre-agreed manner, using materials (plastic boxes, ESD materials and trays).



21. Sustainability and Environment Management

We firmly believe that sustainable, ecological, and socially responsible actions are the foundation for our success in business and other activities.

We expect suppliers to comply with the law and environmental regulations applicable to their business and with the guidelines of the ISO 14001 standard.

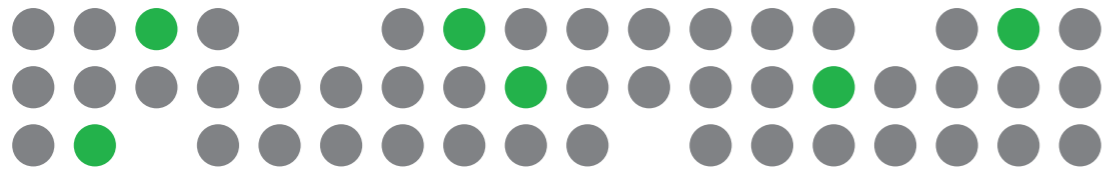
Suppliers shall systematically manage their environmental impacts with respect to, but not limited to energy, materials and climate change-related issues, water, waste, chemicals, air pollution and biodiversity, and set objectives and targets to reduce such impacts. Suppliers identified as having a high environmental impact shall take action and demonstrate proof of continuous improvement toward implementing and applying a recognized environmental management system.

Suppliers are expected to provide relevant information and documentation on the issues above upon request, safeguarding integrity as well as a relationship of mutual trust. While this does not include any commercially sensitive information, all information that suppliers may provide to demonstrate commitment to the

sustainable supply chain principles will be treated discretely and with confidentiality, to enhance opportunities for further improvements on all fronts.

Suppliers can minimize negative impacts on the environment by implementing systems in their facilities that:

- Understand and minimize energy and water consumption
- Continuously improve energy efficiency and use cleaner sources of energy
- Reduce greenhouse gas emissions
- Minimize waste and disposal
- Track, document and report impacts
- Regularly cooperate with Elrad's team



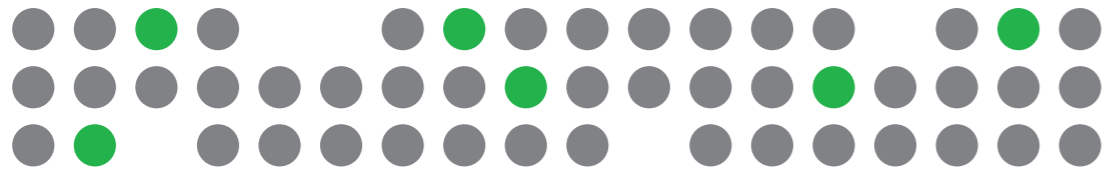
22. Business Continuity/Emergency Plan

The supplier must prepare a business continuity/emergency plan to assure continuous operations and meet customer requirements in cases such as utility disruptions, labour shortages, failure of key equipment, etc.

When the supplier is aware in advance that there will be a disruption in production, the supplier must notify Elrad's location, to where he is supplying the material, the procurement department and the responsible SQE at least 24 hours, if possible, before such disruption.

The cause of the problem must be clarified and immediate measures must be taken to ensure uninterrupted supplies to Elrad. Production interruptions may include, but are not limited to, natural disasters, political unrest, wars, capacity, quality problems, labour strikes and other events that can prevent the supplier from meeting the required capacity.

The supplier must provide Elrad with a plan for immediate and long-term recovery measures and actions to reduce its impact on Elrad's operation.



23. Corporate Social Responsibility

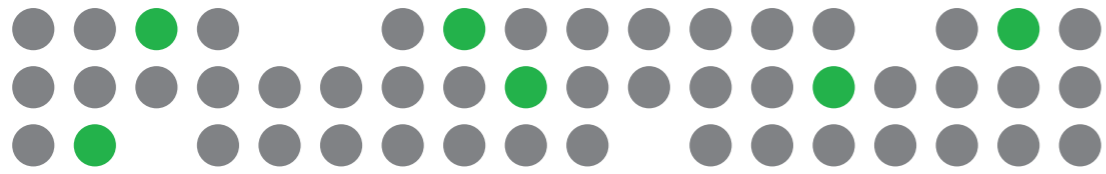
ELRAD International expects its suppliers worldwide to comply with ELRAD's Suppliers' Code of Conduct. The "Suppliers' Code of Conduct" is intended for continuous improvement, to meet the above points regarding work standards, environmental standards, good business practices and ethics, both at ELRAD and its suppliers.

24. Health and Safety

Labour standards based on the Core Conventions and International Labour Standards of the International Labour Organization ("ILO", more at: <http://www.ilo.org/global/lang--en/index.htm>) subject to the provisions of the FLA (Fair Labor Association, more at: <http://www.fairlabor.org/>) and binding regulations and legislation in the business environment.

Safe and healthy working conditions: it is necessary to ensure a safe, clean and healthy working environment, where protection against fires, accidents and dangerous substances is ensured.

Appropriate measures must also be taken to prevent or minimize possible accidents and injuries during or due to work. It is necessary to provide regular training of employees on safety at work. It is necessary to ensure access to clean sanitation and drinking water and to ensure that the basic needs of employees are met.



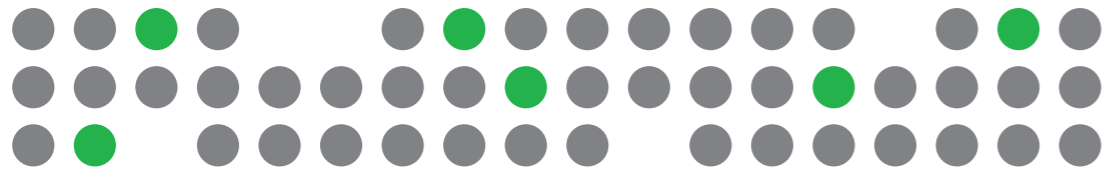
25. Code of Conduct

See document 200E015A03 "SUPPLIER'S CODE OF CONDUCT".

26. Archiving

Samples and documentation are generally kept for 5 years after the end of the production of the series.

Exceptionally, the supplier may request from Elrad early destruction of samples or documentation.



27. Changes in Relation to the Previous Issue

2021-06: New issue.

2022-02: 2nd issue/ update in point 11, added clear requirements regarding SPCN.

2022-06: 3rd issue/ update in points 5 (SPC), 7 (MSA), 14 (clear SNCR timing requirements) and added point 22 (sustainability).

2022-07: 4th issue/ update in points 21, 22, 23, 24 and 25 (content update). Updated point 2 – add terms and abbreviations. Updated point 8 – change of CTQ to special characteristics.

2022-08: 5th issue/ update in point 16.2 (update scoring criteria).

2022-12: 6th issue/ added in point 5.1 (added Type of Capability Studies).

2023-06: 7th issue/ update in point 15 and 16.2 (new criteria for action plan).



SUPPLIER MANUAL

Quality Assurance Document for Suppliers
