1. INTRODUCTION

The quality of ETI final products is highly dependent on the quality of suppliers or sub-suppliers, thus it is very important that the requirements and expectations are distributed throughout the purchase chain. The purpose of this manual is to familiarise ETI suppliers with all requirements and expectations. The contents of the manual should mainly be an aid for the suppliers in constant improvement of their own quality system and not only a simple obligation, that needs to be fulfilled. For ETI, the following values or principles are very important and reflected throughout the manual:

- strategic partnership with suppliers
- constant improvement, innovation, rationalisation of expenses
- risk management
- use of state-of-the art technologies in all areas
- 100% quality
- 100% delivery reliability

By submitting an offer to ETI or signing a purchase contract, the supplier commits to follow the content of the manual and fulfil the requirements stemming from it. The requirements are defined by segments, as shown on the image below.

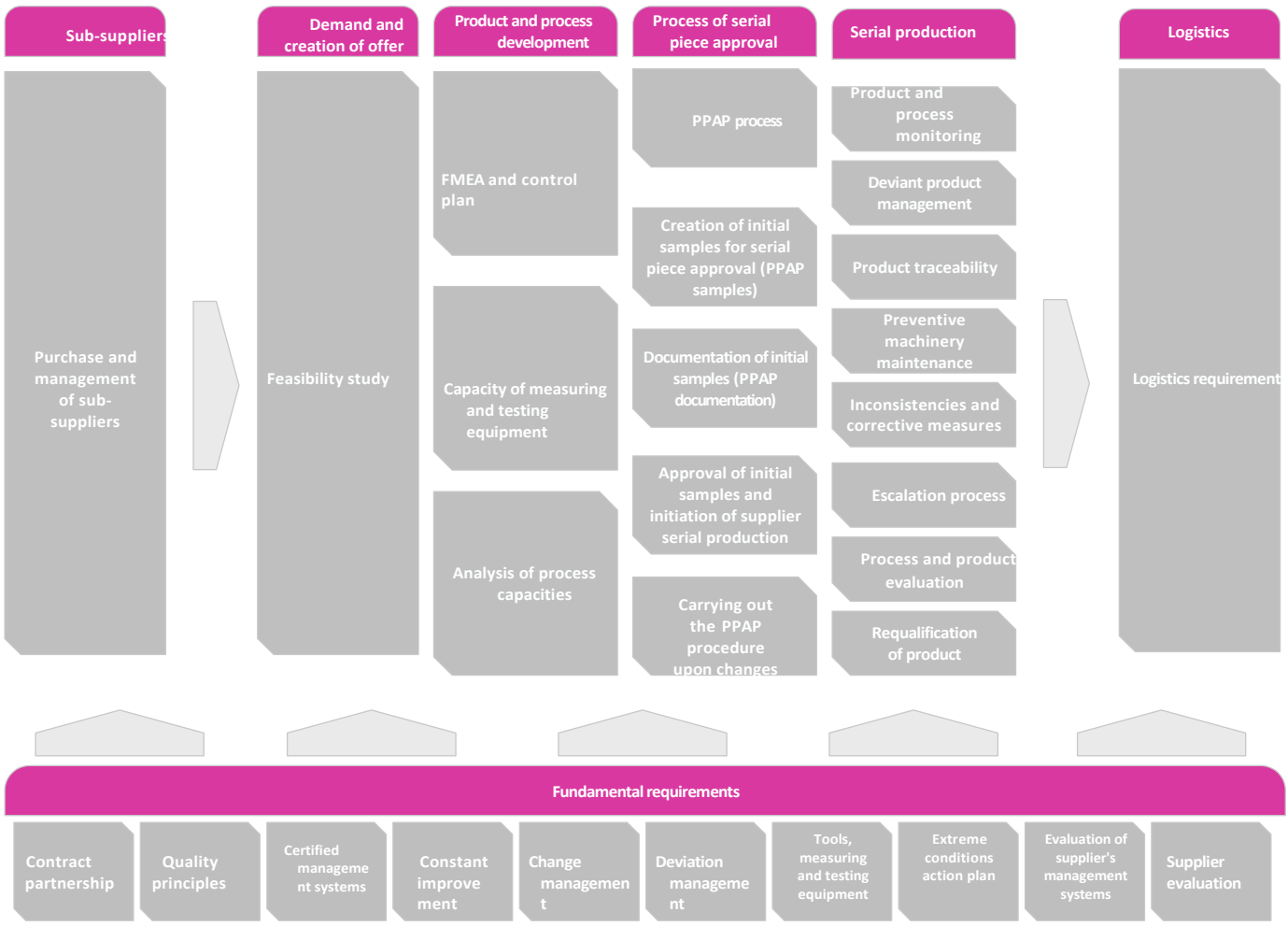

Figure 1: Review of main supplier management segments

2. REQUIREMENTS

2.1 FUNDAMENTAL REQUIREMENTS

Segment	Requirements for supplier
Contractual partnership	Preparedness to conclude contracts and agreements with ETI, preparedness to minimise entry control at ETI (purchase contract, data confidentiality contract...)
	Acceptance of ETI payment conditions and General Purchase Terms.
	Price transparency in offers (open calculations), target price setting and cost structure optimisation.
	The supplier must be able to exchange and process electronic CAD data. He must have a system set up for the protection of CAD data confidentiality.
Quality principles	There must be an emphasis on preventive methods (risk management) and prevention of inconsistencies, as opposed to methods of discovering inconsistencies.
	Principle "zero errors" and "done right the very first time".
	ETI accepts only compliant products, every non-compliant product is rejected.
Certified management systems	The supplier must be certified according to the ISO 9001 quality standard.
	Regarding environmental policy, ETI is obligated to transfer system requirements to its suppliers and thus expects the suppliers to comply with the valid environmental legislation.
	ETI recommends that the suppliers are certified according to the ISO 14001 standard.
	The supplier must regularly inform ETI on certification status, as this influences the evaluation of the supplier.
	The supplier must respect the valid REACH directive.
Constant improvements	The supplier must establish a process of constant improvement as a part of planning and management of operations.
	Activities of constant improvement must be documented and monitored as a key indicator of success.
	ETI expects its suppliers to constantly increase productivity and optimize costs through process improvements and more efficient internal reserve use. Price reduction suggestions by suppliers are a foundation for the evaluation of supplier price competitivity.
	The suppliers are expected to use appropriate methods and tools (PDCA, Six Sigma ...) for a systematic and consistent approach to constant improvement.
	ETI expects its suppliers to strive towards the streamlined production concept.
Change management	Changes upon the initiative of ETI: ETI performs product changes through new demand from the supplier. The supplier carries out a feasibility study, evaluates the costs, and provides a schedule for the implementation of change.
	Changes upon the supplier's initiative: Supplier motions for change through the form »Obr 73-04 Suggestion for Change«, sent to ETI. After suggestion review, ETI submits its position in regards to the suggested change to the supplier. Should ETI approve the change, the supplier may begin with preparations to implement the change in his production.

2.1 FUNDAMENTAL REQUIREMENTS

Segment	Requirements for supplier
	• Every change is subject to the PPAP procedure. This means that the supplier may introduce the change on the product or process only after previous approval of PPAP samples and documentation by ETI. • Changes must be documented in the process and product biography. The destiny of products before the change needs to be agreed upon with ETI. After the change, the first 3 deliveries must be appropriately marked. • The process of initial sample and PAPP documentation approval is usually lengthy and expensive. ETI reserves the right to charge the supplier for the process, if such sampling is frequent at the request of the supplier. • The supplier must notify ETI about planned changes of product or process both in the phase before and after the start of the serial production in the following cases: - Product construction change - Product or material specification change - Use of new, changed, or replacement tools - Change of production method or production process - Change of production location inside or outside of the company - Changes with sub-suppliers or change of sub-suppliers - Restart of production equipment after longer than 12 months.
Deviation processing	• If deviations are identified on the supplier's side, the supplier must issue a documented request for permission for such a deviation on the form »Obr 83-03 Request for deviation approval«. • The supplier must have a written approval for deviation before they can ship products with deviations. First delivery after implementation of a permission for deviation must be appropriately marked. • Permission for deviation is only valid for a limited quantity or products or limited time.
Tools, measuring and testing equipment	• Construction and making of tools is, in general, a responsibility of the supplier, but ETI does have developed and created standards for tools, which ensure quality products throughout the life of a tool. It is expected that the supplier will fully and consistently comply with such standards when making tools. • The suppliers are responsible for the maintenance of all tools, measuring and testing equipment, which is used in the production of ETI products. • Tools and equipment, owned by ETI, must be identified as defined by ETI. • Payment of tools and equipment is carried out after PPAP documentation approval and proof, that the equipment is suitably marked as property of ETI. ETI or its client have the right to review tools and equipment at the supplier's location at any given time.
Extreme measures action plan	• The supplier must have an action plan for unpredictable events (natural disasters, lack of human and machine capacity, logistical failures,...). • The supplier must have insurance of product responsibility.

2.1 FUNDAMENTAL REQUIREMENTS

Segment	Requirements for supplier
Evaluation of supplier's management systems	ETI reserves the right to evaluate management systems, introduced by the supplier. It is expected that the supplier will provide access both to his production plants, as well as his sub-supplier's.
Supplier evaluation	ETI carries out periodic supplier evaluation, at least once per year. Method and criteria of evaluation are described in the document "NOP74.01.04 Supplier evaluation scales". Suppliers are in formed in writing about their grade for a set period. The suppliers are obligated to, within agreed upon time, prepare corrective measures for fields, where they do not achieve ETI expectations.

2.2 SUB-SUPPLIERS

Segment	Requirements for supplier
Purchase and sub-supplier management	It is expected that the supplier has a system set up for the selection and evaluation of sub-suppliers. Sub-suppliers must have a certified quality management system at least compliant to ISO 9001. Requirements which ETI sets for its suppliers must be transferred by said suppliers onto sub-suppliers. Responsibility for sub-supplier selection, so that they achieve quality requirements, is on the side of the supplier. Should the sub-supplier not reach requirements, a plan has to be prepared to develop the sub-supplier. This must be done before serial production begins. Approval of process and product on the sub-supplier's side must be done before approval on the supplier's side. In case of quality issues, originating from sub-suppliers, the supplier must, upon the request of ETI, carry out a sub-supplier evaluation. If required, a representative of ETI is present at this evaluation. The supplier must, upon the request of ETI, provide the results of sub-supplier evaluation.

2.3 DEMAND AND CREATION OF AN OFFER

Segment	Requirements for supplier
Feasibility study	The supplier must review and evaluate all requirements (technical, logistical, costs, temporal) and create a documented feasibility study, which the supplier attaches to the offer. A created feasibility study is a pre-condition for the issuing of an order. All potential unqualified matters or lacking information regarding such things must immediately be clarified between the supplier and ETI. ETI reserves the right to, together with the supplier, create a thorough feasibility study (by individual characteristics). The supplier must also carry out a review of past data about the quality of the existing or similar product with the purpose of preventing a repetition of past mistakes.

2.4 DEVELOPMENT OF PRODUCT AND PROCESS

Segment	Requirements for supplier
FMEA and control plan	The supplier must, in the phase of planning and development, evaluate and minimise risks as much as possible with the FMEA method. Should the supplier be in charge of the planning and development of a product, he must create DFMEA. In any case, he must also create PFMEA as well as LFMEA (logistical faults). In the analysis, a special emphasis must be put on key characteristics. In the phase of planning and development, the supplier must recognise and define all key characteristics. Key characteristics must be marked in compliance with ETI standards on the technical documentation. The supplier must, in the planning and development phase, create and document a diagram of the course of the production process, which must contain all production process operations. A control plan is the result of an PFMEA analysis and must contain at least the key characteristics of the product and the process. With the control plan, the supplier guarantees, that the products and processes are suitably monitored with an appropriate measuring and testing equipment, in a suitable range and frequency. FMEA analyses and control plans must be created in compliance with the AIAG standard. ETI reserves the right of insight into FMEA and control documentation, except for individual elements of FMEA documentation, considered confidential by the supplier.
Capacity of measuring and testing equipment	Measuring and testing equipment, listed in control plans, must be subject to periodic calibration. External laboratories, where periodic calibration is carried out, must be certified according to ISO 17025 or at least approved by ETI. Calibration reports must be suitably documented and the results must be traceable to international standards. For all key characteristics, the supplier must set appropriate measuring and testing methods, along with suitable equipment. For measuring and testing equipment, listed in the control plan, the supplier must show capacity (GRR - repeatability and comparability) in compliance with AIAG standard (chapter MSA - measuring system analysis).
Process capacity study	The supplier must, with static methods, demonstrate the ability of machine and process for all key characteristics. Suitable statistical methods for process supervision are the use of control cards and calculation of indexes of process capacity. Statistical and mathematical foundations for the creation of control cards and capacity index calculation are described in the AIAG manual for (statistical process control). In the development phase, during pre-serial production, the supplier must carry out an initial process capacity study, defined by the index Cmk (machine capability). The index is calculated based on 50 consecutive samples, taken from the production process of the pre-series. the Cmk index is considered to be a short-term indicator. Requirements for index achievement: Cmk >= 1,67 If the achieved results of the capacity index do not achieve goals, the supplier must introduce a 100% quality control, until, through corrective measures, he achieves the required capacity.

2.5 PROCESS OF SERIAL PIECE APPROVAL

Segment	Requirements for supplier
Creation of initial samples for serial piece approval (PPAP samples)	For the approval of a serial piece and production process by ETI, the supplier must carry out production under serial conditions. This is done in the pre-series phase, whereby a certain quantity of products is made under serial conditions. Serial conditions are: serial machines, serial tools, serial material, serial measuring and testing equipment, created and processed work instructions, technological and control documentation. Reliability of production process is tested and evaluated in the pre-series. An evaluation of the production process and analysis of short-term process capacity (Cmk) is also done in the pre-serial production. Under the condition, that products meet all requirements, the pieces from the pre-series in agreed upon quantity (5 pieces / nest) are sent to ETI for approval along with the PPAP documentation.
Documentation of initial samples (PPAP documentation)	The final approval of a serial piece and production process is carried out based on a created and submitted PPAP documentation by the supplier. The requested level or range of submitted PPAP documentation by the supplier is set on the document "Specific Product Requirements". To create and submit the documentation of initial samples, the standard VDA (PPA) or AIAG (PPAP) is usually used. The submitted quantity of initial samples is usually 5 pcs. / nest or according to agreement with ETI. The supplier must create referential products and submit them to ETI for those products, where requests regarding the quality of surface and visual appearance are given (decorative products). Referential products are taken from serial production and represent a minimal standard. Referential products from the initial sampling must be stored by the supplier.
Approval of initial samples and release of supplier's serial production	After the acceptance and review of the first samples and PPAP documentation, ETI submits their position regarding suitability. Possible decisions: 1 approved - serial production approved, 2 temporarily approved - approval for a set quantity or time - corrective measures required, 3 rejected - serial production not approved, corrective measures are necessary. The supplier may begin serial production and deliveries after receiving a written approval of the PPAP documentation by ETI. Without PPAP documentation approval, serial deliveries are forbidden.
Carrying out of PPAP procedure in case of changes	The supplier is obligated to submit initial samples and PPAP documentation in cases, listed under point 2.1 of the fundamental request ➡➡➔change management

2.6 SERIAL PRODUCTION

Segment	Requirements for supplier
Product and process supervision	Supervision of production process must include continued following of all key characteristics of the product and production process. The results thereof must be documented and evaluated. ETI reserves the right of insight into the results of product and process measuring. Implementation of SPC methods (control cards, capacity analysis...) for supervision of key product and process characteristics is obligatory. In the opposite case, a system is introduced to prevent errors regarding all key characteristics. The supplier must prove process capacity for all key characteristics. The demand for an index of process capacity is Cpk >= 1,33. If the results of index of capacity do not meet the objective, the supplier must introduce 100% quality control until, with creative measures, required capacity is achieved. The supplier must have self-supervision in work places. The concept of control of the first and last piece is suggested.
Management of defective products	The supplier must have a system to manage non-compliant products, which ensures, that no poor product is forwarded to following processes and especially not to the client. This also includes suitable identification and manipulation of non-compliant products.
Traceability of products	The supplier must ensure traceability of products from client to sub-suppliers. This includes suitable documentation for each lot, lot separation, documentation of the products and packaging, and shipping documents.
Preventive machinery maintenance	The supplier must have a system of comprehensive preventive maintenance, including a created and documented plan of preventive maintenance and stock of spare parts for key machinery.
Deviations and corrective measures	The supplier is notified of a compliant by e-mail or telephone. To solve complaints, ETI demands that the suppliers use the 8D report (form »Obr 85-03 8D Report«). Within 48 hours, the supplier must implement measures (sorting, upgrading,...) to prevent the spread of non-compliant products (supplier side, in transit, client side) and to ensure uninhibited production at ETI. These measures must be documented in the 8D (filled out up to point 3) report and sent to ETI. Should the supplier not respond to the complaint within 48 hours, ETI has the right to decide freely on the fate of the products, subject to complaint. Within 10 days, the supplier must prepare a complete 8D report with corrective for the prevention of repetition of non-compliance. In the analysis of the cause, the supplier must use problem solving methods such as: pareto analysis, Ishikawa diagram, 5 x why ... ETI submits its position on the corrective measure suitability. Should corrective measures be insufficient, ETI demands new ones from the supplier. In case of identified deviations (supplier-side or client - complaints), feedback must be set up to the process of planning and development with a review and update of the content of existing FMEA analyses (establishment of knowledge and experience base). The supplier is responsible for expenses, created as a result of the complaint and ETI will charge these expenses to the supplier.

2.6 SERIAL PRODUCTION	
Segment	**Requirements for supplier**
Escalation process	In case of repeated quality or logistics inconsistencies, the supplier is made a part of the escalation process: 1st escalation level: supplier alone sets up a problem solving process and regularly reports to ETI. 2nd escalation level: evaluation of the supplier, resulting in an action plan. Supplier regularly reports to ETI on action plan progress. 3rd escalation level: blocking of new orders and demand from the supplier.
Product requalification	The supplier must, before the start of a serial production, create a requalification plan for products supplied to ETI. Requalification must be carried out at least once per year, and includes all dimension and functional tests. In case of negative results, the supplier must immediately inform the entry control at ETI and begin the process of corrective actions.

2.7 Logistics

Logistics requirements are being created.

3. REVIEW OF CONNECTED DOCUMENTS

Obr 73-04	Suggestion for change
Obr 83-03	Suggestion for deviation approval
NOP74.01.04	Supplier evaluation scales
Obr 85-03	8D report