**„Requirement list for Sampling of Purchasing Parts“**

**Purpose:** The following explanations shall provide assistance for the supplier when filling
in the form and drawing up or submitting Pierburg specific requirements.

Product Identification Information

The following items must be indicated on all documents:

* Suppliers: See ordering documents from Purchasing
* Production location: Statement by the supplier
* Part designation: See drawing under “Benennung” (designation)
* Pierburg material No.: See drawing change, please note → in case of any physical change, the material number is updated
* Pierburg document No.: Corresponds to the drawing number
* Index/ Date/ Rev.No.: See drawing under description of change

Document Requirements

1. **Requirement list for Sampling of Purchasing Parts**

**Submission Levels**

Designation of the documents listed under no. 1 to 18 that must be drawn up and maintained, i.e. updated, by the supplier for the respective state or submission level.

**Guideline for list of requirements**

For production and process approval by Pierburg, the supplier must implement all requirements from the requirements list.

* Documents for the requirements marked "S" shall be serviced
* Documents for the requirements marked "R" shall be submitted on request

Deviations regarding document collection shall be agreed with responsible Pierburg Quality representative in advance.

On requirements not subject to the responsibility of the supplier, written notes shall be submitted under the respective serial number.

This Pierburg form sheet shall be used as a cover sheet for sampling.

Further documents pursuant to the submission levels shall be separated by register sheets with the respective numbers. Pierburg file “Cover Sheets BLANKO” shall be used for cover sheets, Pierburg file “PPAP xxxxxxxxx” Index xx” shall be used to link the chapters to the register.

**1.1 Design record (drawing / specification)**

Pierburg drawing and specifications pursuant to the order documents with complete positioning of all features by the supplier.

**1.2 IMDS Entry**

For the purpose of meeting the requirements of the end of life vehicle directive the supplier must declare the materials contained in the products in a material data sheet (MDS) and enter the complete information in an International Material Data System (IMDS).

The IMDS entry must be sent to the Pierburg organisation responsible for component sampling (for Org.-ID see table).

|  |  |  |
| --- | --- | --- |
| *Pierburg Organisation* | *Pierburg Location* | *Org.- ID* |
| Pierburg GmbH | Niederrhein / Berlin | 387 |
| Pierburg s.r.o. | Usti | 387 |
| Pierburg S.A. | Abadiano | 387 |
| Pierburg China | Kunshan | 387 |
| Pierburg India Private Limited | Pune | 387 |
| Pierburg US LLC | Fountain Inn | 387 |
| Pierburg Pump Technology GmbH | Hartha | 387 |
| Pierburg Pump Technology Italy | Livorno / Lanciano | 387 |
| Pierburg Pump Technology France | Thionville | 387 |
| Pierburg Pump Technology India | Pune | 387 |
| Pierburg Pump Technology JV Huayu | Shanghai | 80021 |
| Pierburg Pump Technology Mexico | Celaya  | 387 |
| Pierburg Pump Technology Brasil | Nova Odessa | 20653 |
| Pierburg Pump Technology JV Mikuni | Shanghai | 140727 / 123280 |

The IMDS entry number must be documented in PSW for sampling.

IMDS approval by Pierburg quality assurance shall only be possible if the MDB set-up complies with the applicable IMDS directives and the Pierburg IMDS guidelines.

Advice: With every sequential sampling the conformity of the IMDS-data must be checked and if needed to be revised unrequested to provide an actual update.

For communication regarding IMDS entries following contact shall be used:

 IMDS\_MT@cz.rheinmetall.com

1. **Engineering Change Documents**

For technical changes or deviations from the indications in the drawings/specifications, as well as process changes the respective REA (Request for Engineering Approval) shall be submitted to the Pierburg supplier quality development department / Pierburg plant supplier quality assurance before submitting PPAP sampling.

These change(s) must be indicated, assessed and approved by Pierburg.

1. **Customer Engineering Approval**

If the supplier is planning any change(s) the Pierburg approval must be given and forwarded herewith.

These change(s) must be indicated, assessed and approved by Pierburg, e.g. process changes, relocation, use of alternative suppliers, etc.

In case of Directed buy parts, approval of change(s) must be present and available from end customer.

1. **Design FMEA**

Where development responsibility is with the supplier, he shall draw up and maintain a Design FMEA.

Determination of the numbers of process flow chart, D-/P- FMEA and control plan must be continuous.

As proof, at least the FMEA cover sheet and an overview sheet summarising the risk shall be submitted.

The FMEA shall be drawn up pursuant to the latest version of VDA and/or AIAG reference manual.

1. **Process Flow Chart**

The flow chart is a graphical description of the logical order of production, inspection and assembly steps of the overall process, including any side processes (e.g. rework, scrapping, external process steps) from goods receipt to dispatch.

A flow chart checklist can be taken from the AIAG brochure "APQP".

The form of presentation shall be left to the supplier, but the scope of the flow chart should correspond to the AIAG standard requirements.

The respective key for the symbols used shall be included.

1. **Process FMEA**

Process FMEA shall be drawn up and maintained by the supplier.

Marking / inclusion of all specific characteristics from the drawing, specifications and FMEA derivations.

Determination of the numbers of process flow chart, D-/P- FMEA and control plan must be continuous.

As proof, at least the FMEA cover sheet and an overview sheet summarising the risk shall be submitted.

The FMEA shall be drawn up pursuant to the latest version of VDA and/or AIAG reference manual.

1. **Control Plan**
* The control plan has to be created according to the latest AIAG requirements
* Determination of the numbers of process flow chart, D-/P- FMEA and control plan must be continuous
* Consideration of all specific characteristics from the drawing, specifications and FMEA derivations
* Designation of applicable working and inspection instructions also
* Minimum contents:
* Process steps (e.g. incoming inspection of raw materials and purchased parts, process approval, external process steps, outgoing inspection, product audit, re-qualification inspection)
* Characteristics to be verified, including tolerances, process parameters (if

 required)

* Marking specific characteristics
* Measuring equipment used
* Documentation or control method
* Reaction plan
* Inspector (e.g. QS inspection, works self-inspection)
* Frequency & number of parts tested
* Test scope / intervals
1. **Measurement System Analysis**

According to the specifications (nominal values + tolerances), suitable measuring or inspection means shall be used and continuously documented in the inspection plan as well as in all inspection documents used.

The measurement capability and approval status of all measuring equipment used shall be determined and documented.

A measuring equipment list for all measuring equipment used for the product and its results shall be submitted to the measuring equipment system analysis.

Furthermore, the results of the measuring equipment system analysis for specific characteristics shall be indicated in the Pierburg form sheet "Process steering".

Measuring equipment shall be inspected regularly, marked and being released for use.

Measuring equipment analysis shall be drawn up pursuant to the AIAG reference manual "MSA". ANOVA method has to be used for analysis.

* **Repeatability and reproducibility (%GR&R) / variable)**

Variable GR&R is based:

1. on 3 inspectors with 3 measuring series 10 parts each or
2. on 2 inspectors with 2 measuring series with 10 parts each per inspector
3. without user impact with 3 measuring series 15 each

🡪 0-10%: Generally considered to be an acceptable measurement system

🡪 10-30%: May be acceptable for some applications (approval required)

🡪 > 30%: Considered to be unacceptable.

For measuring equipment with a %GR&R value above 10%, a statement regarding use shall be required. AN approval of the customer is mandatory in this case.

* **Repeatability and reproducibility (%GR&R) / attributive)**

Attributive GR&R is based on 3 inspectors with 3 measuring series with 50 parts each

|  |
| --- |
| Effectiveness Criteria Guidelines |
| Decision Measurement System | Kappa | Effectiveness | Miss Rate | False Alarm Rate |
| Acceptable for the appraiser | ≥ 75% | ≥ 90% | ≤ 2% | ≤ 5% |
| Marginally acceptable for the appraiser – may need improvement |  | ≥ 80% | ≤ 5% | ≤ 10% |
| Unacceptable for the appraiser – needs improvement | < 75% | < 80% | > 5% | > 10% |

1. **Dimensional Results**

Test results (AIAG format) of all sizes and features stated in the drawing and specifications, including the assessment must be performed by the supplier (OK/ NOK).

All the respective documents shall be signed by the supplier.

The measuring results shall be proven with 5 components per cavity each for drawing & specification features (the results must represent all production processes, production facilities, cavities and tools). The supplier must retain an additional measured sample of the PPAP production lots for his perusal.

The number of components to be tested can be coordinated with Pierburg in exceptions.

1. **Material, Performance Test Results**

Test results (AIAG format) of all materials and functions named in the drawing and specifications (e.g. part specific Pierburg requirements and/or Pierburg norms), including the assessment to be performed by the supplier (OK/ NOK).

The respective documents shall be signed by the supplier.

Supporting documentation shall be added, e.g. for:

* Materials certificates pursuant to DIN EN 10204/ 3.1 including nominal and current values
* Copies of all PPAP cover sheets with approval of sub-components
* Test reports of the design / product validation inspections of the initial sample parts

Including test set-up / description

1. **Initial Process Studies**

Listing of all special characteristics already included in the control plan from the drawing and specifications representations as well as the FMEA derivations, respectively from special coordination with Pierburg Quality Assurance.

* Special characteristics see PN 02.040

If there are no features indicated by Pierburg on the drawing, the supplier shall nominate at least one indicative feature for his process control and prove it accordingly.

For each feature, the capability of the test / measuring equipment to be used according to the control plan shall be proven.

* Machine capability Cm / Cmk: **≥ 2,0**
* Random sample test scope n ≥ 50
* Removal period in sequence
* Preliminary process capability Pp / Ppk: **≥ 1,67**
* Random sample test scope n ≥ 5
* Removal period 25 random samples at intervals
* Scope of production: PPAP production (at least 300 parts)
* Long-term process capability Cp / Cpk: **≥ 1,33 (≥ 1,67 for A-Characteristics)**
* Random sample test scope n ≥ 5
* Removal period at intervals
* Scope of production serial production
* Process days min. 20 production days (based on Ppk)

For features with a lack of capability, a poka yoke protection or 100 % inspection and measures plan must be present.

Documentation of the results on form sheet 4: Process Steering (annex 4)

1. **Qualified Laboratory Documentation**

Documents proving the certification / accreditation state and relevant scope of the institute.

Where any external labs / institutes are charged, they must be accredited.
Where no external labs / institutes are charged, this item is not applicable.

1. **Appearance Approval Report**

If required, proof of haptic, acoustic, smell, visual and surface features shall be included.

Special visual areas / surfaces are marked on the drawing. In this case, the respective PPAP / AIAG form sheet shall be used.

If applicable, reference samples / images must be present.

1. **Sample Production Parts**

The minimum size of the production batch shall be 300 components and serves as initial proof of production capacity (OEE).

Undercutting of this batch size shall only be permissible with the approval of the responsible Pierburg quality representative.

1. **Master Samples**

- Approved samples / retained samples (cavity, tool, process) incl. measuring / materials
/ function report / etc. are present at the supplier's. Retained samples must be clearly marked / labelled.

- Where required, OK/NOK samples for process monitoring

- Border samples where required

1. **Checking Aids**

Specific test equipment shall be component-specific test equipment, e.g. receptacles, gauges, models, templates, test / inspection facilities.
Confirmation of test equipment that can be used according to the provisions must be present as a certificate. Acceptance criteria correspond to the requirements of the MSA reference manual (AIAG).

Images / descriptions of parts-specific test equipment / gauges shall be submitted

- Same reference system as on the drawing

- Measuring report of the gauge / device

- Capacity study pursuant to MSA

- Inclusion in test equipment monitoring

1. **Pierburg-Specific Requirements**

**Customer-specific requirements**

* List of requirements for sampling
* Purchased parts (Pierburg form sheet 2a)
* Electronic components (Pierburg form sheet 2c)
* Feasibility evaluation (Pierburg form sheet)
* Product lifetime record
* Ppm agreement Zero Defect
* Purchased parts (Pierburg form sheet 5)
* Electronic components (any format)
* Packaging datasheet
* Purchased parts (Pierburg form sheet)
* Electronic components (any format)

The above form sheets must be filled in completely.

Others to be attached under chapter 17.6.

* 1. List of Requirement s for sampling of purchased parts

 Attachment of PPAP requirement list as agreed/defined with/by Pierburg purchasing.

* 1. Feasibility Evaluation

Inclusion of the original feasibility evaluation (form sheet 3; annex 3) from the Pierburg product request that was the basis for order assignment.
For process / product changes after order assignment, an updated feasibility evaluation shall also be included (form sheet 3; annex 3).

* 1. Product Lifetime Record

The supplier must operate a system for recording the change history of a component and the involved procurement / production / test processes.
All data relevant for the product lifetime must be available here. The target of this documentation is compliance with statutory provisions regarding components subject to mandatory documentation and limitation of damages claims in case of complaints (also see traceability).

The product lifetime record has the following partial aspects:

### Documentation / mandatory information, e.g.:

* Design change
* process change, tool change
* material-/semi-finished material changes
* moving of the production location
* change of the subcontractor
* type of product marking
	1. ppm Agreement Zero Defect

In the scope of continuous quality improvement, Pierburg shall also coordinate appropriate continuous quality improvement with the supplier.

The supplier shall inform Pierburg in writing and without delay if any detrimental deviations from the agreed-on quality target can be expected. Corrective measures and dates for achieving the target shall be named in this context.

Agreement on a quality target shall not mean acceptance of the quality level or defective components by Pierburg and shall not affect the liability of the supplier for warranty and damages claims.

*Documentation on form sheet 5: ppm Agreement Zero Defect (annex 5)*

* 1. Specification of Packaging

Pierburg packaging data sheet, among others amended by, e.g., sketches, photographs (see annex 8). Packaging has to be aligned between supplier and Pierburg before PPAP submission. Packaging data sheet approved by Pierburg has to be attached in PPAP.

* 1. Capacity Verification

A capacity study has to be conducted before / at PPAP and documented by using the Capacity Verification Sheet [see annex 6a].

* 1. Others (Directed Buy, Customer Release, CQI-XX Assessments, …)

**A.** Proof of performed customer approval (Pierburg customer to supplier) according to the respective documents.

**B.** PSW-(AIAG Format) of the supplier to Pierburg, on which the Pierburg material number and drawing state, as well as a link to the customer number, are indicated.

**C.** CQI-XX Assessments

1. **PSW Cover Sheet**

PSW (AIAG Format) with indication of the sample type and complete data on identification of the products [see sample; annex 2d].

The respectively valid PSW pursuant to AIAG shall be used.