2037738	1.1.2 + 1.3.6.2 Quality label T (service tools) added; 1.2 Parts category now in the drawing header	RON303_en_ 2037738.doc
2035950	Section 2 changes, Special characteristic definition updated, additional details and 2.3, 2.3.2. and 2.3.3. IATF 164949 Standard replaced obsolete reference to ISO TS 16949 and reference to the VDA book " A process description covering Special Characteristics (SC)"; VDA Volume 4 Section 3 "Economic Process Design and Process Control"; VDA Volume 5 "Measurement and Inspection Processes. Capability, Planning and Management" added.	RON303_en_ 2035950.doc
2032274	Passages added to 1.3.2.2 (quality label) and to 2.3 (special characteristics)	RON303_en_ 2032274.doc
2032044	Passage on the subject of "Standard Parts according to 21.A.303" integrated	RON303_en_ 2032044.doc
2027766	Change: New Q label category "S" for Aircraft parts	Ron303_en_ 2027766.doc
2024761	Changes in Section1 about Quality label, adaption of Matrix about minimum requirement to suppliers, change from BRP-Powertrain to BRP-ROTAX, attachments deleted (old revisions)	Ron303_en_ 2024761.doc
2012205	Transmission of KC-DP Characteristics from RON 100 (2.1, 2.3.4), new layout for form feasibility analysis in attachment	RON_303_en_ 2012205.doc
2009597	Pp/ppk, cp/cpk values adapted; KC-P characteristics deleted; KC-F: attributive inspected characteristics-> new. modifications apply to items: 1.4.2.3., 2.1, 2.3, 2.3.2, 2.3.3	RON303_en_ 2009597.doc
2008659	CDG Responsibilities new, 2.3, Characteristics categories including definitions (new: KC-F and KC-P to replace KC; KC-V cancelled)	RON303_en_ 2008659
2006078	Implementation of a new parts category (design and quality label) AN for standard parts which are used for aircraft engines. New form for feasibility attached (acc. to Mod.Nr. 2006622)	RON303_en_ 2006078
2001267	Item 2.3.2 and item 2.3.3. The parts categories 3 or D, demanded for KC-characteristics was delited.	RON303_ 2001267
2000280	Revision – reorganisation in accordance with the terms of Part 21 in the course of POA-Project, L-parts escaped	
2005012010	RON 303 with attachment completed	
2004081706	General revision of contents. Introduction of design labels, quality labels. 'KC O' renamed 'KC V'	
2004040602	Renaming of all characteristics. New terms: 'KC A' and 'KC M'. RON not issued	
2003122202	General revision. Characteristic 'CTQ' omitted. New characteristic 'O'	
2002060506	Addition of characteristic 'CTQ' under 'Section 1' and definition of characteristic 'CTQ'. See. 3.3	
1998060804	Replacement of the terms 'part S' and 'characteristic S' with the former terms 'part D' and 'characteristic D'	
9647	'RLV' replaced accordingly by RON in text	
Edition	Description of change	Document

Created on 1994 03 14; AA/HeC	Checked on 12. Februar 2024	Checked on 12. Februar 2024	Checked on 13. Februar 2024	Checked on 13. Februar 2024	Checked on 13. Februar 2024	released on 13. März 2024	replaces Edition RON303 2035950
revised on 20240117 SQ/AUM Ralf Aumaier	SQ/HAMED	OA/STE	PM/DM	SO/WR	QM-POA/KRA	PT/WIN	

CONTENT 3

Content

All parts used in the production of engines by BRP-ROTAX are subject to a system of classification which enables all parties concerned (in-house or external) to plan and implement their processes with regard to the type and application of the component. The parts are classified according to the origin of their designs and according to a rating depending on their application. The classification of parts is described in ‘Section 1’.

Special characteristics of parts that fall within the category of characteristics specified in ‘Section 2’ of this RON standard are indicated on the respective drawings.

Field of application

This standard RON 303 is valid for or all parts in the bill of material [are raw parts (ROHT), ready-to-assemble sourced parts (EBFZ), parts produced in-house (HALB) and prototyping-parts (VERS)] of an engine produced by BRP- ROTAX.

Responsibilities:

All effected internal and external departments are responsible about execution.

Section 1 Categories of parts

1.1 Definition of 'parts categories'

The 'part category' is always composed of the combination of design label and quality label.

1.1.1 Design Label

A design label provides information about the predominant part of the development of the components. The following labels are possible:

A - Aircraft (all parts existing in aircraft engines)
R - BRP- ROTAX design
F - Outside (supplier's) design
K - Catalogue goods
N - Standard parts
H - Operating materials (no design character)

1.1.2 Quality label

The quality label informs about working efforts needed for a part. The working effort comprehensive the efforts of all product life cycles from Development to mass production.

The following labels are possible:

C - Part without incoming inspection
1 - Part with low attention
2 - Part normal attention
3 - Part with high attention
D - Part subject to documentation
N - Standard part in conjunction with aircraft design label (A)
S – Special part in conjunction with aircraft design label (A)
T – Service tools in conjunction with Aircraft (A), Rotax (R)- and outside design (F).

Example: A part of category "R2" is a part developed by BRP- ROTAX with normal supervision requirement.

For Design label „K" and „N", only the Q-label „1" will be used.

1.1.3 Reference to previous definitions of parts labels

In a former issue of this standard, the following definitions have been used and are still valid (See 1.5 'Provisional regulations for the introduction of parts classifications').

Part L	part subject to legal requirements (legal)
Part D	component subject to documentation requirements
Part Z	drawing part
Part N	standard part

1.2 Documentation of 'parts categories'

The part category is maintained in the SAP system of BRP- ROTAX. It is listed in the drawing in the title block under the signature field. E.g. "RON 303 D/Q label | R2".

1.3 Application of 'parts categories'

1.3.1 Design label

The design label is set by the BRP- ROTAX Engineering Design Department.

It provides information about the responsibility for the design. In combination with quality labels, different processes have to be followed and/or requirements arise on the part of the supplier (see 1.4 'Implications').

1.3.1.1 A - Aircraft

The design responsibility for aircraft parts, according to IR21 (EASA), lies with the "Design Organisation". As a result of this, parts used in BRP ROTAX aircraft engines may only display this label, even if the design was not originally developed by BRP- ROTAX (e.g. screws according to DIN). This explains why a drawing exists for every aircraft part except for AN parts.

1.3.1.2 R – Rotax Design

The design of such parts is predominantly undertaken by BRP- ROTAX.

The following technical guidelines may be applied:

- Drawings (normally from BRP- ROTAX)
- BRP- ROTAX company standards, national and international standards
- Technical Requirement Specification (determined by BRP- ROTAX)
- Order description
- QSV (Quality Assurance Agreement)

1.3.1.3 F - Supplier's Design

The design of such parts is predominantly undertaken by a supplier, although the general conditions and prescribed properties of the design must stem from BRP- ROTAX.

The following technical guidelines may be applied:

- Description of the installation space by BRP- ROTAX (Digital Mock Up, DMU)
- Drawings (normally from supplier)
- BRP- ROTAX company standards, national and international standards
- Technical Requirement Specification (determined by BRP- ROTAX)
- Product specification (determined by the supplier)
- Order description
- QSV (Quality Assurance Agreement)

1.3.1.4 K – Catalogue goods

The design of such parts was undertaken by the supplier. BRP- ROTAX has selected these pre-existing parts.

The following technical guidelines may be applied:

- Catalogue details
- If catalogue details insufficient, product specification (from the supplier)
- BRP- ROTAX company standards, national and international standards
- Order description

1.3.1.5 N – Standard parts

The design of a standard part is described by the relevant standard which appears in the SAP description of parts.

The following technical specifications may be applied:

- National and international standards
- Order description

1.3.1.6 H – Operating materials

Operating materials have no design character. e.g. engine oil, adhesives, packaging, etc. The specification appears in the order description.

1.3.2 Quality label

The Q-label is based on functionality, requirements on specifications and on the feasibility of the part.

The drawing respectively the specification (TRD,….) is part of the decision making process.

Single parts assembled to modules can have different Q-labels.

1.3.2.1 Quality labels '1, 2, 3'

The Q-label will be defined by the responsible Q-Departmend in accordance with responsible Design Department and if used in an aircraft application, also with the department OA.

1.3.2.2 Quality label D

Parts subject to documentation will have the label D. A part is said to require documentation if it features at least one of the characteristics classified as a characteristic 'KC D' (see 2.3.1 Characteristics 'KC D')

or, if for traceability reasons, for parts classified as "A" parts, a serial number on the part (serialisation in plain text) is required. These aircraft parts with D label must be already listed in RON152 (for serialisation in plain text) or must be added to RON152.

Parts with D-label are generally to be dealt like parts with label '3'. Additionally, the following points arise:

Manufacturer requirements:

- All measurement data of the specified characteristic 'D' are to be recorded, documented and conveyed to the Quality Department of BRP- ROTAX.
- The characteristic marked "KC D" is to be fully documented and traceable up to its fitting in the motor (motor number). In general this degree of traceability is achieved by allocating a consecutive serial number to the component (see RON 150).

Stipulations on the basis of:

- Authority guidelines
- In-house specifications pertaining to quality
- Additional requirements

1.3.2.3 Quality label 'C'

The quality label 'C' is assigned to parts which do not undergo an inspection of goods receipt. Such parts are directly delivered under special agreement with "BRP- ROTAX Montage"

(BRP- ROTAX assembly department).
This label may only exist in conjunction with design label 'H'.

1.3.2.4 Quality label N

As there are all parts used in division aircraft are identified with the design label A, the aircraft standard parts have to be marked with the additional quality label N. This quality label N can only occur in combination AN and declares a standard part which is used for aircraft engines.

AN parts are not standard parts according to 21.A.303.

Aircraft standard parts (AN) are subject to recognized standards and are obtained from suppliers approved by the PO. They are also subject to the sourcing and change process, as well as an internal approval process. (VA AC 08-004, AA BE-183)

1.3.2.5 Quality label S

Parts with quality label S are specific parts which require exceptional handling.

Special parts are for instance: discs, springs, screws, nuts, clamps and cable ties.

Excluded are AN parts (aircraft standard parts) which comply with an international standard.

The quality indicator S is permitted only in combination with the design indicator A (AS = Aircraft Special part)

1.3.2.6 Quality label T

Parts with quality label **T** are service tools.
The **T** quality label is only permitted in combination with the **A**, **R** and **F** design label.

1.4 Implications

The combination of design labels and quality labels gives rise to various requirements / demands on the part of the supplier and BRP- ROTAX.

1.4.1 Inquiry documents

Design label	Implication
R and A	An inquiry drawing and if applicable a technical requirement specification must be submitted.
F	This drawing is replaced by a technical requirement specification which should also contain a Digital Mockup describing the assembly space**.**
K	A supplier's product specification has to be submitted.
N and H	The standard and/or model design must be specified in the order description.

1.4.2 Requirements on suppliers

BRP- ROTAX makes the following minimum requirements on the suppliers according to the parts categories

Matrix showing the minimum demands for suppliers

A detailed description of the demands is provided from page 9 onwards.

In individual cases, the responsible Quality department can change to higher

Possible combinations between Design- and quality label	AN	AS	A1	A2 AT	A3 AD	R1	R2 RT	R3 RD	F1	F2 FT	F3 FD	K1	N1	HC
1.4.2.1 Supplier's drawings									●	●	●			
1.4.2.2. Feasibility analysis				●	●		●	●		●	●			
1.4.2.3 P-FMEA					●			●			●			
1.4.2.4 Initial sample as per RON 436			●	●	●	●	●	●	●	●	●			
1.4.2.5 Change management	●	●	●	●	●	●	●	●	●	●	●			
1.4.2.6 Incoming Inspection at supplier for sub-supplied parts	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1.4.2.7 Process Audit				●	●		●	●		●	●			

1.4.2.1 Supplier's drawing / supplier's specification, product specification

The supplier provides a drawing for parts falling in the aforementioned categories, which is then confirmed by BRP- ROTAX by adding its title box/letterhead.

A product specification is to be provided on request. The product specification is the binding detailed description of the deliveries to be met. Unlike the technical requirement specification (to be provided by BRP-Rotax) its contents are precise, complete, testable, and connected to technical definitions which lay out the operating conditions.

1.4.2.2 Feasibility Analysis

The Feasibility Analysis is a tool used by the supplier to check, if the inquired part can be produced feasible or rather is appropriate for the intended usage.

At least for the parts mentioned in the matrix of minimun requirements, the Feasibility Analysis has to be forwarded with the offer. Due to the BRP-ROTAX form sheet, all characteristics have to be marked (red/green) what is a key factor for sourcing decisions.

1.4.2.3 P-FMEA

The supplier provides an analysis of all possible errors and causes of error, plus relevant countermeasures (Q-tests, etc.), at least for features deemed "critical" during the manufacturing process .

1.4.2.4 Initial sample and initial sample inspection

If required in this RON standard, the initial sampling has to be carried out according to RON 436. The Purchasing Department of BRP- ROTAX has to quote the initial sampling in its order description.

1.4.2.5 Management of changes from BRP- ROTAX components

A supplier must contact the Purchasing Department of BRP-Rotax in case of changes of design, process, or material. If necessary, the Department will order an initial sampling, accept the change without the sampling or reject the change. The request for an initial sampling normally occurs only in conjunction with changes.

1.4.2.6 Incoming Inspection

If required, a supplier has to maintain a system for incoming inspection of goods receipt for outsourced parts, elongated workbench and raw materials.

1.4.2.7 Process Audit

The supplier investigates a manufacturing process or dedicated parts of it by using a documented procedure, to figure out if it is possible to produce the required characteristics from drawings / specifications with a reliable process.

1.5 Provisional regulation for the introduction of ‘parts classifications’

As this RON standard is referred to in various areas, the following provisional regulation must be set for indefinite time:

If former labels appear on drawings, the RON issue 2003122202 is applicable. If the new labels with two digits are used, the updated RON is applicable, and is also to be used as the basis for new revisions of parts or drawings.

If this updated RON is referred to in other standards or work instructions, such a reference should be interpreted as follows:

New	Old
None	Part ’L’
AD, RD, FD	Part ’D’
R1, R2, R3, F1, F2, F3 , A1, A2, A3	Part ’Z’
N1, HC, K1, AN, AS	Part ’N’; N2, KC, NC, K2, K3, AN

Section 2 Categories of characteristics

2.1 Definition of 'characteristics categories'

Special characteristic = **K**ey **C**haracteristic = 'KC'. In terms of the linguistic usage *Six Sigma,* these characteristics are also indicated 'CTQ' (Critical to Quality).

These measurement details and other indications with important requirements are emphasized separately on a drawing or specification.

Characteristic	Key Characteristic for	Special characteristic for
KC D	Documentation	Requirements concerning documentation
KC SPC	Statistical Process Control	Tolerances and Fit
KC F	Function and Durability	Function and durability
KC-DP	Documented measures at Prototype parts	Documentation of 100 % of a prototype part

2.2 Documentation of 'characteristics categories'

All characteristics 'KC' are recorded in a separate chart which includes the tolerance and coordinate specifications above the BRP- ROTAX title box/letterhead.

The special characteristics are entered on to the drawing directly next to the relevant characteristic (e.g. next to measurement/size indications, etc.).

Documentation on special characteristics must be retained for at least 15 years following the delivery of the last serial batch. After this period BRP- ROTAX should be asked whether these documents are to be handed over to BRP- ROTAX.

2.3 Application of 'special characteristics' / 'characteristics categories'

'Special characteristics' are product characteristics or manufacturing process parameters which have an impact on function, performance requirements, safety or compliance with regulations, fit, and further processing of the product.

'Special characteristics' represent minimum requirements and do not exempt an internal/external supplier from his overall responsibility for the process from delivering conforming products.

The rough concept about the compliance with "KC"-characteristics is already to provide in the feasibility analysis.

Characteristics with special significance are aligned with IATF 16949 and VDA "Process Description covering Special Characteristics (SC)"

You can find detailed information on the compliant application of statistical process control in the current version in "VDA Volume 4 Section 3 / Economic Process Design and Process Control" or in "QS-9000 / SPC".

If the required capability values can not be held, an additional checking method shall be implemented in accordance with the responsible Q-department.

2.3.1 Characteristics 'KC D'

These characteristics help to define the exact wear of fits, but also to provide evidence of characteristics referring to a special component.

These characteristics have to be measured and documented to 100%.

The Department of Quality Assurance provides the documents necessary to enter the dimensions for documentation. The person responsible in the Quality Assurance Department will agree to the presentation of these documents and the exact form of transfer of the generated data.

A part marked 'KC D' will also be marked with the quality label 'D' (see 'Section 1').

Example for entry on drawings:

∅ 52 $^{+0,1/-0,1}$ **KC D**

2.3.2 Characteristics 'KC-F'

Characteristics with the code KC-F are critical to, or of considerable importance for, the proper function and durability of the unit as a whole (usually combustion engines, transmissions, Electrical Motor, Inverter, Battery and VCU and the vehicles driven by them).

They must be indicated as function-critical characteristics in drawings and in the specification documents for production (checking instruction, measurement program, control plan, PFMEA etc.) as well as in the CTQ process.

Appropriate protection measures to secure process and product during series production must be coordinated in advance with the responsible BRP-ROTAX quality department. (eg statistical process monitoring according to point 2.3.3, poka yoke, 100% control, detailed specific inspection plans / maintenance plans, ...)

Corresponding evidence must be provided at the latest during initial sampling.

For prototype parts (parts made according to 9-digit drawings) KC-F features shall be treated as KC-DP according to point 2.3.4

Example for entry on drawings:

∅ 12 $^{+0.016}$ **KC-F**

ATTENTION. In prior drawings can be described KC-F characteristics as KC characteristics.

2.3.3 Characteristics 'KC SPC'

Characteristics with the code KC-SPC are critical characteristics for tolerances and fit which require SPC as control method to secure process and product.

Ongoing process capability has to be monitored and documented during production.

The following conditions must be met:

- pp / ppk * 2.00 / 1.67 must be proven in the course of the initial sampling
- cp / cpk * 1.67 / 1.33 must be proven in the series process
- Process control with ~~intervention~~ control limits
- Consideration of the ~~intervention~~ control limits in the specification documents
- Centric position of the process is to be targeted
  (except one-side limited characteristics)

If the required value can not be reached, the concerned characteristic shall be evaluated with a 100 % check within the tolerance limits until this process capability is ensured.

The end of the 100% check can only be authorised in written form by the responsible quality department at BRP-ROTAX.

Statistical evaluation must be carried out although in spite of 100 % control .

The statistical recordings must be made available at any time on demand of the responsible quality-department of BRP-ROTAX..

For prototype parts (parts made according to 9-digit drawings) KC-SPC features shall be treated as KC-DP according to point 2.3.4

Example for entry on drawings:

$\varnothing 52^{+0,1/-0,1}$ **KC SPC**

2.3.4 Characteristics KC-DP

Key Characteristic for function which is valid only for 9-digit parts.

Function- critical characteristics at prototype parts are those characteristics, which are essential for the function or durability of a part or whose behavior should be observed under the circumstances of testing and operation.

Documentary evidence:

Measurement report with numbered and dedicated components. Responsible for documentations and storage of the measurement report is the supply department for prototype parts (PV) for parts used in prototype engines from step P1.x till Px.x.

For tests or markings that could affect the component, the procedure must be agreed in advance.

The marking as function dimension has no direct influence on the allowance of deviations, the permissible defect rate or on the type and extent of the tests to be carried out.

Example for entry on drawings:

∅ 34 $^{+0,02/-0,03}$ **KC-DP**

Standards specified:

IATF 16949

VDA / QS9000

RON 150

RON 152

RON 436

VDA “A process description covering Special Characteristics (SC)

VDA Volume 4 Section 3 “Economic Process Design and Process Control"

VDA Volume 5 “Measurement and Inspection Processes. Capability, Planning and Management“