Work Instruction

015 Research + development

Determination and designation
Special Characteristics

W_015_026

1 Purpose

These work instructions govern the procedure for establishing and handling special characteristics.

2 Scope

All companies of the GRAMMER Group worldwide

3 Terms

Special characteristic (BM): Product characteristics or production process parameters that can affect safety or compliance with regulatory requirements, fit, function, performance, or further processing of the product. Special attention must be paid to these characteristics.

Critical characteristics (CC): Special characteristic relevant to safety. Defectiveness or outage can pose an immediate hazard to life and limb. Causal processes must be predictable and can't be improbable.

Significant characteristics (SC): Special characteristic requirements/functions.
Application for:

- Essential functional requirements (fit, function, tolerances, etc.)
- Production-related requirements (difficult to manufacture, etc.)
- High economic damage (customer, Grammer, supplier)

4 Responsibilities

The determination of the special features must be interdisciplinary between product development, industrial engineering and quality.

Each affected specialized department is responsible for applying the information specified in accordance with this document.

5 Description

5.1 Application

Special characteristics ensure stable production in keeping with requirements.
The goal is to avoid the increased risks for Grammer that may arise from delivery of non-compliant products.

Designation as a special characteristic is associated with increased requirements for process reliability and documents. Possible increased expenditures arising from the heightened care taken are justified by the possible consequences arising from functional failure. It is important to do “as much as necessary, as little as possible” in order to ensure proper safety.

As orientation for the decision of special characteristics are the attachments for each product division. The specification of the special characteristics has to be done interdisciplinary within the context of FMEA. The decision against special characteristics, which are listed in the attachment, have to be documented in the FMEA. It can be possible, that during the product development process, more special characteristics will be defined. The documentation have to be updated accordingly and the team members have to be informed

If further special characteristics become necessary, which are not listed in the attachments, the “Engineering Quality” department have to be informed. The decision to expand the attachments is made together with the responsible team leaders.

Two categories of special characteristics with different requirements are used internally at Grammer. Special characteristics are established based on the information in the following table.

	Special characteristics	
Characteristic	**SC**	**CC**
Description	Product or process characteristics affecting: • Fit • Function • Performance • Further processing of the product	Safety-related product or process characteristic resulting from: • Legal requirements • Customer requirements • Independent risk evaluation within the context of corporate due diligence
Establishment	- Characteristics assigned a significance of 7 to 9 in the FMEA and with a probability of occurrence of ≥ 6 - Characteristics that have been recognised as important based on function and environmental testing, simulations or feedback from the field - Customer requirement	- Characteristics assigned a significance of 10 in the FMEA - Characteristics that have been recognised as critical based on safety testing, simulations or feedback from the field - Customer requirement

5.2 Consistency

Marking and correct numbering on all internal documents must be consistent. Deviating from this, customer documents can be marked corresponding to the respective customer standard. The department which ist responsible for the specific document has to ensure the consistency.

All documents should generally be marked up to the process step in which the special characteristic is created.

- **Assembly drawing / assembly group drawing / individual part drawing**
  Specification of the necessary special characteristics as well as a table with overview of the defined special characteristics; Transfer / comparison with product FMEA

  Design verification plan
  Transfer of the relevant special characteristics from the assembly drawing

  Test reports
  Transfer of the relevant special characteristics from the design verification plan

- **Product FMEA**
  Transfer/alignment of all special characteristics with all drawings

  Process FMEA
  Transfer of the relevant special characteristics from the product FMEA

  Control plan
  Transfer of the relevant special characteristics from the process FMEA

- **Production and test instructions**
  Transfer of the relevant special characteristics from the process FMEA and drawings

- **Initial prototyping**
  Transfer of the relevant special characteristics from the assembly drawing and individual part drawing

- **Other records**
  All other documents referencing special characteristics must be marked

5.3 Procedure/definition on drawings

The special characteristics must be defined on the drawing as soon as possible, and no later than Phase 2 of PLM.

The following information is automatically integrated into each drawing:

CC	kritische Merkmale sicherheitsrelevanz: Festlegung durch gesetzliche Vorschrift, Kunde oder interne Risikobewertung CRITICAL CHARACTERISTICS SAFETY, DEFINITION BY LEGAL REQUIREMENTS, CUSTOMER OR INTERNAL RISK EVALUATION
SC	signifikantes Merkmal (Passung oder Funktion): Festlegung durch Kunde oder interner Risikobewertung SIGNIFICANT CHARACTERISTICS (FORM OR FUNCTION), DEFINITION BY CUSTOMER OR INTERNAL RISK EVALUATION

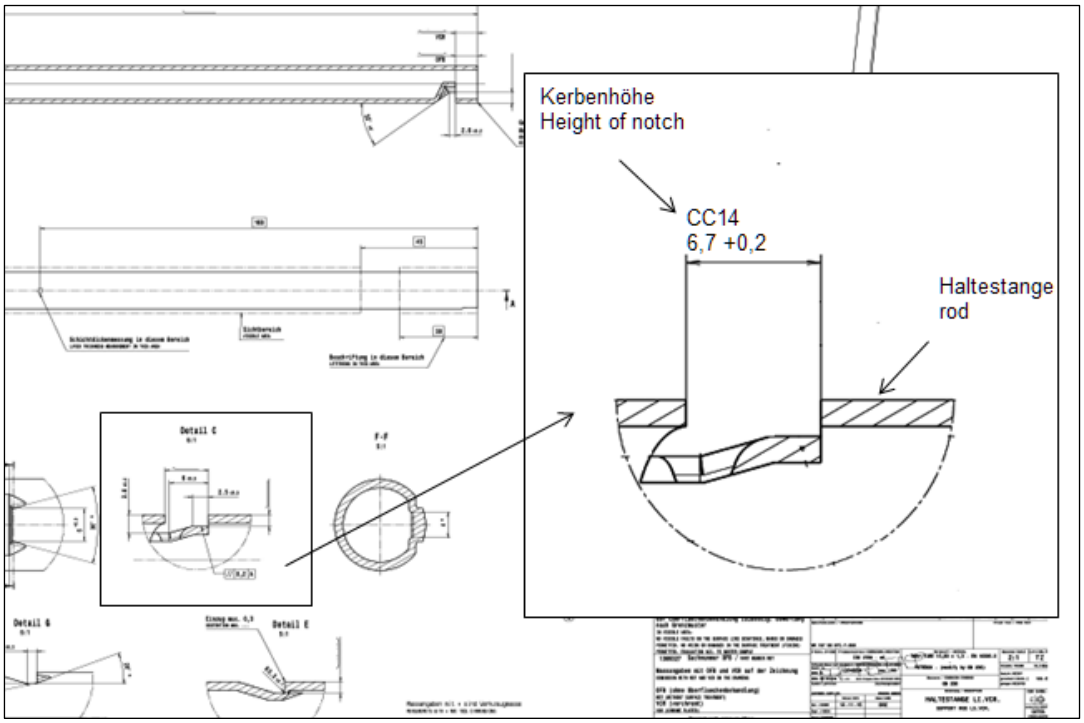
5.3.1 Specification / designation of special characteristics at drawings

Special characteristics have to be specified / designated in more detail on the level where the special characteristic is created.

On the customer drawings the designation have to be accordingly the customer symbols.

Designations on internal drawings have always been written above the measurement entry with the correct numbering. There is the possiblity, that special characteristics with the same numbers are entered multiple at one drawing or at different drawings.

Example: notch height on the grab handle:



5.3.2 Overview of the special characteristics at drawings

On all drawings, a summary table with the special characteristics required for this component is to be created. For this, the reference table from the CAD must be used. Special characteristics which are not required have to be deleted from the table without changing the numbering.

On the customer drawing, this table should be placed above the Grammer-head.

In the "Comment" column, possibly necessary additional information can be entered.

Example:

SC-NO.	Merkmal CHARACTERISTIC	Kommentar¶ COMMENT¶
SC5	Hauptmass Kontrollrippen MAJOR DIMENSION CONTROL RIBS	
SC7	Gewicht Kunststoffteil WEIGHT PLASTIC PART	252,1 ± 5g

5.4 Test and performance requirements

In order to be designated as a special characteristic, the following minimum requirements must be met for process reliability and test frequency. If higher performance requirements are agreed with the customer, these must be applied.

	Special characteristics	
Characteristic	**SC**	**CC**
process capability to be proven	Short-term Cmk > 1.67 Long-term Ppk / Cpk > 1.33	Short-term Cmk > 2.0 Long-term Ppk / Cpk > 1.67

A 100% test can also be carried out as an alternative. Evidence of destructive tests must be shown during requalification

5.5 Retention periods

Retention periods for documents with special characteristics are shown in the following table.

	Special characteristics	
Characteristic	**SC**	**CC**
Retention periods	At least 6 years after the document or drawing is created	At least 15 years after production is concluded or in accordance with higher customer requirements

5.6 Customer symbols

In the following table are examples for information of customer used symbols for special characteristics (not guarantee of completeness). Binding are always the currently valid customer standards. At customer drawings always the customer symbols have to be used

	SC	Symbol	CC	Symbol
BMW	Prüfmerkmal		legal (L)	L
Chrysler	diamond (D)		shield (S)	
Daimler	Prüfmerkmal		Sicherheitsrelevanz (DS)	DS
			Zertifizierungsrelevanz (DZ)	DZ
DIN	Prüfmerkmal		Dokumentationspflicht (D)	D
FIAT	significant characteristic (SC)		critical characteristic (CC)	
Ford	significant characteristic (SC)	kein Symbol	critical characteristic (CC)	
General Motors	fit and function (F/F)		safety complaint S/C	
Toyota			法規特性 HOUKI_TOKUSEI Sachrecht 保安特性 HOAN_TOKUSEI Sicherheitsmerkmale	
VDA	Besonderes Merkmal Funktion (BMF)		Dokumente mit besonderer Archivierung (DmbA) Besonderes Merkmal Sicherheit (BMS)	A
VW	Prüfmerkmal		D (Dokumentationspflicht) oder TLD (Technische Leitlinie Dokumentation)	D oder TLD
CNH	Important Characteristics		Critical Characteristics	

5.7 Traceability

It is absolutely essential that CC characteristics are traceable. The type of traceability (e.g. component, charge, delivery date) must be specified.

5.8 Employee training

All employees who are involved in creating or working with special characteristics or who create or work with documents providing evidence related to special characteristics must undergo training carried out by the respective departments at appropriate intervals.

6 Applicable documents

VDA association special characteristics	
DE_EN_Referenzen_besonderer_Merkmale_Interiors	A_015_015
DE_EN_Referenzen_besonderer_Merkmale_Consoles_Armrests	A_015_016
DE_EN_Referenzen_besonderer_Merkmale_Commercial_Vehicles	A_015_017