

Confidential, all rights reserved. Observe copyright notice ISO 16016.

Language code to ISO 639-1: en

ICS 01.140.30, 03.120.10

Descriptors: Documentation requirement, record, check gauge, inspection, drawing

### Contents

	Page
<b>1 Scope</b> .....	<b>1</b>
<b>2 Area of application</b> .....	<b>1</b>
<b>3 Purpose</b> .....	<b>2</b>
<b>4 Normative references</b> .....	<b>2</b>
<b>5 Documentation requirements</b> .....	<b>2</b>
5.1 Parts subject to documentation, D parts.....	2
5.2 Safety parts subject to documentation, DS parts.....	2
5.3 Determination of relevant parts and dimensions .....	2
5.4 Release of drawings.....	2
5.5 Test process suitability for special GPS features. ....	2
<b>6 Drawing entry of documentation requirement</b> .....	<b>2</b>
6.1 Component test .....	2
<b>7 Marking of D and DS parts</b> .....	<b>3</b>
7.1 Marking of special features .....	3
7.2 Marking of check dimensions of special features.....	4
7.3 Examples:.....	4
7.4 No detailed marking of special features.....	4
7.5 Drawing symbols (adhesive film) of special features without special archiving obligation "SC" .....	4
7.6 Drawing symbols (adhesive film) of special features with archiving obligation "DS" or "DZ" .....	4
7.7 Definition of special features with special archiving obligation .....	5
7.8 Duration of use and archiving of documents .....	5
7.9 Definition of special features without special archiving obligation .....	5
7.10 Determination of special features .....	5
7.11 Uniform marking of special features in documents.....	5
<b>8 Inspection documentation (recording)</b> .....	<b>5</b>

**Revisions:**

Part 2 of VN 1631 was newly created for Voith Turbo.

**1 Scope**

The Standard applies exclusively to the business divisions of Voith Turbo.

**2 Area of application**

This standard is used for indicating documentation requirements in drawings to ensure Voith's product standard. Additional customer requirement going beyond the Voith Standard must be processed in an order-related manner. In the case of outsourcing of drawings with documentation requirements, this standard must be made available.

Earlier editions:

	Name	Date	Signature
Created by	Friedrich-VPH-c1qg	2014-04-22	sgd. (Friedrich)
Checked by	Bürkle-VTA-acit	2014-04-22	sgd. (Bürkle)
Approved by	Wulz-VPH-c1qg	2014-04-24	sgd. (Wulz)

### 3 Purpose

This standard establishes the mode of entry for documentation requirements in drawings, regulates the responsibility for the assignment of documentation requirement symbols and defines the test process suitability for special GPS (geometrical product specification) features. The designer thus indicates all quality features that have to be specially inspected in the production of design components and whose results have to be documented. Documentation requirements must also be entered if they are expressly demanded by the legislator, by classification societies, acceptance authorities or customers. In general, all design parts must be manufactured in accordance with the drawing, all dimensional specifications, tolerances and surface data must be complied with. This must be ensured by the Manufacturing Department without requiring the design engineer to stipulate a documentation obligation. The documentation of the quality features inspected by specialist personnel is an additional effort and must therefore be restricted to the absolutely necessary minimum by the design engineer. If documentation requirements are taken over from existing drawings, they must always be checked whether they are necessary.

### 4 Normative references

DIN 406 10

### 5 Documentation requirements

Documentation requirements must be specifically stipulated by the Design Department.

#### 5.1 Parts subject to documentation, D parts

Parts whose failure can lead to significant property damage and/or if the function is dependent on compliance with these dimensions. A marking of the drawings for D parts can be stipulated.

#### 5.2 Safety parts subject to documentation, DS parts

Parts on whose failure significant property damage/personal injury (fatal injury) must be expected. Strict inspections and careful documentation of the results are required. Safety parts subject to documentation; DS parts. A marking of the drawings for DS parts can be stipulated.

#### 5.3 Determination of relevant parts and dimensions

Components and dimensions requiring documentation are determined on the basis of results from risk assessments, such as FMEAs, reports and information about damage that has occurred, feedback from Manufacture, the test field and service, as well as special customer requirements.

#### 5.4 Release of drawings

The inspection and release of drawings is regulated in the respective QS regulations. For drawings with documentation requirements, special release authorizations can be established.

#### 5.5 Test process suitability for special GPS features.

For determining the special GPS (Geometrical Product Specification), the requirement  $\%R\&R \leq 30\%$  is to be observed.

Another definition can be made individually for critical measuring methods in documented coordination with the specialist department.

$\%R\&R$  = Repeatability & Reproducibility in % related to the reference figure (RF)

RF = Reference Figure e.g. process tolerance, process variation, tolerance, class tolerance

### 6 Drawing entry of documentation requirement

The frames used for drawing entries are described in DIN 406-10, Section 3.2.6.

#### 6.1 Component test

The component test always indicates an inspection with a clear allocation between documentation and component, this also includes assemblies. This can be done by the permanent identification of the material with serial numbers or other appropriate identification, with which an allocation of the documentation to the inspected material is created. The identification point on the component must be entered in the drawing. Quality features (dimensions, surfaces, shape and position, etc.) must be inspected and each part clearly documented so that it can be allocated. The documentation can also be done in a collective record for several components provided that a clear allocation of the inspection results to the components is ensured.

Examples:

Surface (Ra value)	Shape and position	Dimensions

**7 Marking of D and DS parts**

D and DS parts acc. to 6.1 are marked permanently with punched numbers, by engraving or with electric engraver. There is also an additional possibility of marking the parts with a permanent felt pen (temporarily), with an acid stamp or by a coat of paint. The point of the "direct marking" on the product must be indicated in the technical drawing. If parts do not have to be marked, this must be stated in the drawing (see following adhesive films).

**7.1 Marking of special features**

**SC** ► Features without special proof

Entry in drawing	Minimum requirement for duration of use and archiving
	<p>≥ 3 years after EOP</p> <p>Observe customer specifications!</p>

**DS** ► Features with safety relevance "DS" and special proof

Entry in drawing	Minimum requirement for duration of use and archiving
	<p>≥ 15 years after EOP</p> <p>Observe customer specifications!</p>

**DZ** ► Features with certification relevance "DZ" and special proof

Entry in drawing	Minimum requirement for duration of use and archiving
	<p>≥ 15 years after EOP</p> <p>Observe customer specifications!</p>

\*) Continuous numbering of measuring and inspection points

7.2 Marking of check dimensions of special features

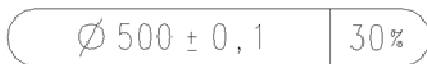
Entry in drawing	Meaning
	1 = Capability evidence 2 = Sampling inspection per batch or lot single values have to be archived 3 = 100% check 4 = Control plan (Voith Turbo with supplier)

7.3 Examples:

	<b>SC</b> = Special feature SC 1; 2 = A capability evidence and the performance of sampling inspections is demanded
	<b>DS</b> = Feature with safety relevance 3 = For the feature, a 100% check is required
	<b>SC</b> = Special feature SC - a capability evidence and the performance of a 30% sampling inspection is demanded, no allocation to single part required, e.g. for process or machine function analyses

7.4 No detailed marking of special features

If a check dimension is displayed on the drawing without special marking, i.e. without DS, SC or D, it must always be regarded as marked with "DS". Thus, the old dimensions on the drawings with special features turn into dimensions subject to documentation.



7.5 Drawing symbols (adhesive film) of special features without special archiving obligation "SC"

a	b	Besondere Merkmale SPECIAL CHARACTERISTICS
a:	SC	Besonderes Merkmal / SPECIAL CHARACTERISTIC
	DS	Sicherheitskritisch / RELEVANT TO SAFETY
	DZ	Zertifizierungsrelevant / RELEVANT TO CERTIFICATION
b:	1	Fähigkeitsnachweis / CAPABILITY EVIDENCE
	2	Stichprobenprüfung je Charge bzw. Los, Einzelwerte sind zu archivieren / SAMPLING INSPECTION PER BATCH OR LOT, SINGLE VALUES HAVE TO BE ARCHIVED
	3	100%-Prüfung / 100%-CHECK
	4	Prüfplan (Voith mit Lieferant) / CONTROL PLAN (VOITH WITH SUPPLIER)

7.6 Drawing symbols (adhesive film) of special features with archiving obligation "DS" or "DZ"

a	b	Besondere Merkmale SPECIAL CHARACTERISTICS
a:	SC	Besonderes Merkmal / SPECIAL CHARACTERISTIC
	DS	Sicherheitskritisch / RELEVANT TO SAFETY
	DZ	Zertifizierungsrelevant / RELEVANT TO CERTIFICATION
b:	1	Fähigkeitsnachweis / CAPABILITY EVIDENCE
	2	Stichprobenprüfung je Charge bzw. Los, Einzelwerte sind zu archivieren / SAMPLING INSPECTION PER BATCH OR LOT, SINGLE VALUES HAVE TO BE ARCHIVED
	3	100%-Prüfung / 100%-CHECK
	4	Prüfplan (Voith mit Lieferant) / CONTROL PLAN (VOITH WITH SUPPLIER)
<b>A-</b>		Archiving obligation/ Documentation required

**7.7 Definition of special features with special archiving obligation**

Product features (special features) with significant influence on product safety, health and safety or compliance with legal regulations with special proof/archiving.

Examples of DS features (safety-critical features) with regard to life and limb:

- Brake systems (e.g. tightness),
- Steering or wheel suspension (e.g. torques),
- Retention systems (e.g. contacting),
- Lighting (e.g. function)

Examples of DZ features with regard to certification relevance - compliance with laws and homologation:

- Waste Gas Emission Act (e.g. CO<sub>2</sub>),
- Electromagnetic Compatibility
- Crash resistance
- High flame resistance (e.g. burning rate)

Proof:

Proof furnishing concerns both quality requirement documents and quality records

**7.8 Duration of use and archiving of documents**

Quality requirement documents and quality records with regard to critical features.

- DS/DZ: Duration of archiving  $\geq$  15 years after EOP (end of production)

- SC: Duration of archiving  $\geq$  3 years after EOP (end of production)

**7.9 Definition of special features without special archiving obligation**

All critical product or process features with regard to mountability, life cycle, critical dimensions, however, without influence on safety relevance and/or certification relevance (legal and homologation regulations)

**7.10 Determination of special features**

- As customer requirement (must be stated explicitly in the application engineering documents and/or requirements specifications)
- Internal by product and process development as well as change management
- Within the development and changing process

**7.11 Uniform marking of special features in documents**

- ▶ SC
- ▶ DS
- ▶ DZ

- Drawing.
- Control Plan (production control plan)
- FMEA
- Testing plans
- If required, in operation manuals

Especially for prototype parts, the following remains to apply (unless otherwise agreed with the customer):

On first delivery, the supplier must measure at least one part completely and for all other parts at least the special features and deliver them numbered / documented.

If too many special features are defined, this has significant influence on economic efficiency, capacity and documentation scope both for the manufacturer and for Voith.

**8 Inspection documentation (recording)**

The marking of the measuring points must tally with the inspection record. Filing/archiving must be done in accordance with the QS regulations/provisions.