

**RIGID NON-PLASTICISED  
PVC PIPES AND FITTINGS****Technical document No.°055-  
06**

Specifications applicable to the Discharge of Rainwater  
intended for Siphonic Drainage Systems Group

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## MODIFICATION HISTORY

Revision no.	Application date	Modifications
00	21/12/2018	Update to the document layout and reference
01	23/07/2019	Deletion of part 2 – « Marking conditions ... » Creation of the NF Mark appendix.

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## Part 1. SCOPE

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This Technical Document deals with the Discharge of Rainwater intended for Siphonic Drainage Systems Group.

### 1.1 APPLICABLE REFERENCE STANDARDS AND COMPLEMENTARY SPECIFICATIONS

#### 1.1.1 Reference standards

➤ **Family - Solid-Wall PVC Pipes and Fittings**

**NF EN ISO 3126** (September 2005) Plastics piping systems – Plastics components – Determination of dimensions.

**NF T 54-030** (December 1981) Plastics – Unplasticised polyvinyl chloride moulded fittings for domestic water drainage installations not subject to pressure – Specifications.

**NF EN 1329-1** (July 1999) – Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure – Unplasticized poly(vinyl chloride) (PVC-U) – Part 1: Specifications for pipes, fittings and the system.

#### 1.1.2 Fields of application

The NF EN 1329-1 Standard specifies the requirements for the pipes and fittings indicated for drainage applications defined below:

The pipes and fittings in the discharge of rainwater intended for siphonic systems group are used only for producing drainage systems for rainwater using the siphon effect.

Using pipes and fittings from the discharge of rainwater intended for siphonic systems group for other applications is not permitted.

Fittings obtained by welding multiple elements (forming) are excluded from this Technical Document.

#### 1.1.3 Complementary specifications

The reference specifications and test methods for the NF Mark Rigid Non-Plasticised PVC Pipes and Fittings are defined in the tables below. They are based on the abovementioned standards with possible additions or changes.

#### 1.1.4 Admission ranges

The admission range presented during the 1<sup>st</sup> application must, at a minimum, include the following products:

Cases of pipes: 2 diameters

Cases of fittings: 3 types of fittings /DN and 2 DN minimum

This range may be produced on 1 or multiple sites with the same trade name.

This reference system is not intended to approve the consistency of diameters proposed to establish a functional network.

**TABLE 1 - SOLID WALL PVC DISCHARGE OF RAINWATER, INTENDED FOR SIPHONIC SYSTEMS FAMILIES**

**Pipes and Fittings Specifications**

<b>Characteristics and Test methods (4)</b>	<b>Pipes</b>	<b>Fittings</b>
Reference standard	NF EN 1329-1	NF T 54-030 ; NF EN 1329-1
Appearance	(1)	(1)
Marking	(1)	(1)
Dimensions (2)	see table 3	see table 4
Socket depth		
Colour	Green (similar to RAL 6007)	
Density NF EN ISO 1183-1 <b>Method A</b> (2)	1370 to 1460 kg/m <sup>3</sup>	
Vicat softening temperature NF EN 727 (2)	≥ 75°C (5)	
Tensile properties NF EN ISO 6259-1 and ISO 6259-2 (2)	TS ≥ 45 MPa	
Maximum stress	E ≥ 80%	
Elongation at break		
Reversion at 150°C NF EN ISO 2505 - (2)	R ≤ 5% No blisters	
Impact resistance Pipes: NF EN 744 - method (2)	TIR ≤ 10%	
Oven test at 150°C NF EN ISO 580 - method A (2)		(3)

- (1) The pipes and fittings may not have any defects visible to the naked eye such as scratches, marks, grains, cracks or air pockets that negatively impact use.  
The pipes and fittings must be a homogeneous green colour similar to the colour RAL 6007.  
The marking must be consistent with the requirements provided in Technical Document 2 discharge of rainwater intended for siphonic systems group.
- (2) With additional clarifications indicated in Part 2 of Technical Document 1.
- (3) The fittings may not have any openings along the entire thickness of their walls in any given welding line nor deterioration of the surface, penetrating more than 1/2 the thickness of the wall, particularly near an injection point.
- (4) The editions of the standards cited for use are those in force on the revision date of this certification reference system (see page 2 of this Technical Document), unless otherwise specified by the Mandated Body.
- (5) Siphonic systems being intended to convey exclusively rainwater, as explained in Standard NF EN 752, the reference to the Vicat temperature is Standard NF EN 12200, relating to gutter downspouts.

**TABLE 2 - SOLID WALL PVC DISCHARGE OF RAINWATER, INTENDED FOR SIPHONIC SYSTEMS FAMILIES**

**Specifications for assemblies**

Characteristics and Test methods (1)	Sealing ring assembly category		Solvent welding assembly category
	FIXED	SLIP	
Assembly composition and dimensional characteristics	NF EN 1329-1 (table 11)	NF EN 1329-1 (table 15)	NF EN 1329-1
Leaktightness under negative pressure (3)	NF EN 13844 (15 to 25°C, without deviation or deformation)		
Quality of elastomer sealing rings NF EN 681-1 (2)	NF EN 681-1		

(1) The editions of the standards cited for use are those in force on the revision date of this certification reference system (see page 2 of this Technical Document), unless otherwise specified by the Mandated Body.

(2) Ozone resistance test: Rubber sealing elements that are protected and packaged separately until the time of their assembly must meet the same requirements, except using an ozone concentration of  $(25 \pm 5)$  pphm instead of  $(50 \pm 5)$  pphm.

(3) Tests can be carried out on pipes and fittings from TD2 with the same dimensional characteristics.

Criteria: The change in negative pressure must be less than or equal to 0.05 bar during the first and second 15 min periods (table 1 of Standard NF EN 1452-5 / clause 4.5).

**TABLE 3 - SOLID-WALL PVC DISCHARGE FAMILY**
**Dimensional characteristics of pipes with plain ends or sleeves**

In accordance with NF EN ISO 3126 and NF EN 1329-1

 - Length Tolerances:  $\pm 1\%$  for  $L < 5$  m  
 $\pm 5$  cm for  $L \geq 5$  m

- Socket: according to NF EN 1329-1 (only sockets for solvent-welding),

- Other dimensions

Average external diameter DN (mm)	Nominal Thickness th (mm)	Tolerances (mm)			on Dq (1) (mm)
		on DN	Thicknesses		
			th min	th max	
32	3.0	+0.2 0	3.0	3.5	$\pm 0.5$
40	3.0	+0.2 0	3.0	3.5	$\pm 0.5$
50	3.0	+0.2 0	3.0	3.5	$\pm 0.6$
63	3.0	+0.2 0	3.0	3.5	$\pm 0.8$
75	3.0	+0.3 0	3.0	3.5	$\pm 0.9$
80	3.0	+0.3 0	3.0	3.5	$\pm 1.0$
90	3.0	+0.3 0	3.0	3.5	
100	3.0	+0.3 0	3.0	3.5	
110	3.2	+0.3 0	3.2	3.8	
125	3.2	+0.3 0	3.2	3.8	
140	3.5	+0.4 0	3.5	4.1	
160	4.0	+0.4 0	4.0	4.6	
200	4.9	+0.5 0	4.9	5.6	
250	6.2	+0.5 0	6.2	7.1	

(1) Any external diameter (Da)



**TABLE 4 - SOLID-WALL PVC DISCHARGE FAMILY**
**Dimensional characteristics common to the fittings**

Dimensional characteristics common to the fittings								
DN	Spigot			Socket			Thickness (min)	
	Average External Diameter tolerances	Max. variation of a given diameter	Length of socket h	Average Internal Diameter tolerances	Maximum out-of-roundness	Socket depth L (1) (3)	Body of the fitting	Socket and Spigots (2)
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
32	+0/+0.2	0.5	≥22	+0.2/+0.4	0.35	22	3	2.0
40	+0/+0.2	0.5	≥26	+0.2/+0.4	0.45	26	3	2.0
50	+0/+0.2	0.6	≥31	+0.2/+0.4	0.55	31	3	2.0
63	+0/+0.2	0.8	≥37.5	+0.2/+0.4	0.7	37.5	3	2.0
75	+0/+0.3	0.9	≥43.5	+0.2/+0.5	0.8	43.5	3	2.0
80	+0/+0.3	1.0	≥46	+0.2/+0.5	0.9	46	3	2.3
90	+0/+0.3	1.1	≥51	+0.2/+0.5	1	51	3	2.3
100	+0/+0.3	1.2	≥56	+0.2/+0.5	1.1	56	3	2.3
110	+0/+0.3	1.4	≥60	+0.3/+0.6	1.2	≥ 60	3.2	2.4
125	+0/+0.3	1.5	≥60	+0.3/+0.6	1.4	≥ 60	3.2	2.4
140	+0/+0.4	1.7	≥60	+0.4/+0.7	1.55	≥ 60	3.2	2.4
160	+0/+0.4	2.0	≥60	+0.4/+0.7	1.75	≥ 60	3.2	2.4
200	+0/+0.5	2.4	≥ 60	+0.4/+0.9	2.2	≥ 60	3.9	2.9
250	+0/+0.5	3	≥ 60	+0.4/+0.9	2.75	≥ 60	4.9	3.7

- (1) **Socket depth tolerances**  
+0/+2 (mm) for  $\varnothing \leq 100$
- (2) **Thickness of the sockets for solvent welding and the spigot**  
 $\varnothing \leq 75 \text{ mm} : th \geq 2 \text{ mm}$   
 $\varnothing > 75 \text{ mm} : th \geq 0.75 \text{ times the thickness of the body}$
- (3) **Socket depths must be checked using go/no-go plug gauges; inspecting the socket depth of a fitting must be carried out in order to ensure functionality of the fitting.**

For solvent-weld fittings and sealing ring fittings, a 5% reduction in the thickness of the walls caused by core offset is permitted. In such cases, the average of the thicknesses of the 2 opposing walls must be equal to or greater than the abovementioned values.

**Other dimensions**

Fittings defined in this technical document from captive, non-interchangeable systems: no Z-length is required, in accordance with chapter 6.3.5 "Design lengths" of Standard NF EN 1329-1.

The design length(s) (Z-length) of fittings must be provided by the manufacturer.

**SOLID-WALL PVC DISCHARGE FAMILY**

**Dimensional characteristics of fittings** (dimensions and tolerances in mm)

SOLVENT WELDING ASSEMBLY

**Figures 8 and 9 in Standard NF EN 1329-1**

Elbows 45° FF (Female-Female)  
Elbows 45° MF (Male-Female)  
(Fields of application: see page 3)

**SOLID-WALL PVC DISCHARGE FAMILY**

**Dimensional characteristics of fittings** (dimensions and tolerances in mm)

SOLVENT WELDING ASSEMBLY

**Figures 10 and 11 in Standard NF EN 1329-1**

Elbows 90° FF (Female-Female)  
Elbows 90° MF (Male-Female)  
(Fields of application: see page 3)

**SOLID-WALL PVC DISCHARGE FAMILY**

**Dimensional characteristics of fittings** (dimensions and tolerances in mm)

SOLVENT WELDING ASSEMBLY

**Figures 14 and 15 in Standard NF EN 1329-1**

Equal wyes 45° FFF  
Equal wyes 45° MFF  
Reducing wyes 45° FFF  
Reducing wyes 45° MFF  
(Fields of application: see page 3)

**SOLID-WALL PVC DISCHARGE FAMILY**

**Dimensional characteristics of fittings** (dimensions and tolerances in mm)

SOLVENT WELDING ASSEMBLY

**Figure 13 in Standard NF EN 1329-1**

Reducing eccentric sleeve couplings MF (Male-Female) and reducing plugs MF (Male-Female)  
Short reducers MF (Male-Female)  
(Field of application: see page 3)

**SOLID-WALL PVC DISCHARGE FAMILY**

**Dimensional characteristics of fittings** (dimensions and tolerances in mm)

SOLVENT WELDING ASSEMBLY

**Figure 12 of Standard NF EN 1329-1**

Equal sleeve couplings with stop and/or slip FF (Female-Female)  
(Fields of application: see page 3)

**TABLE 5 - SOLID-WALL PVC DISCHARGE FAMILY**

**Dimensional characteristics of fittings** (dimensions and tolerances in mm)

SLIP ASSEMBLY WITH SEALING RING  
(NF T 54-030 AND NF EN 1329-1; TABLE 15)  
(Fields of application: see page 3)

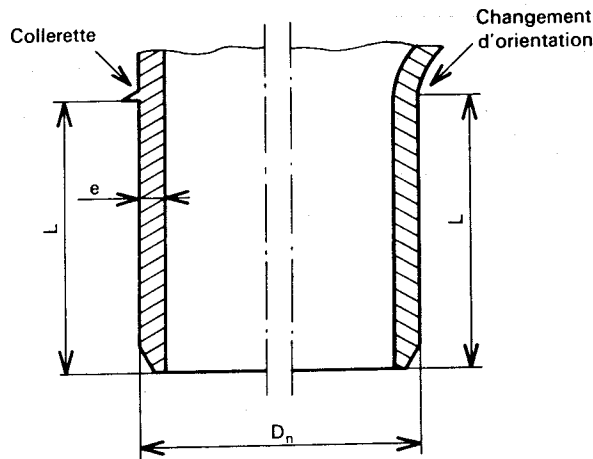


Figure 1 - Bout mâle

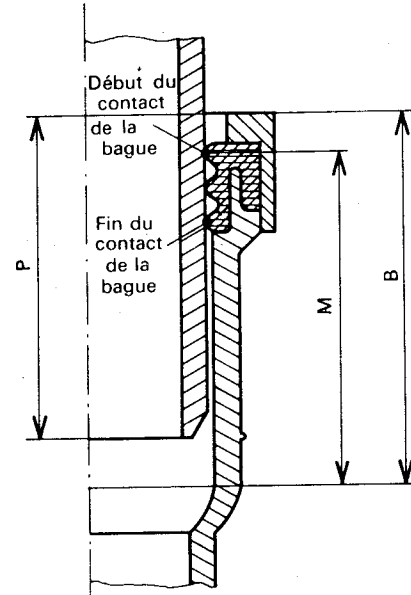


Figure 3 - Assemblage.

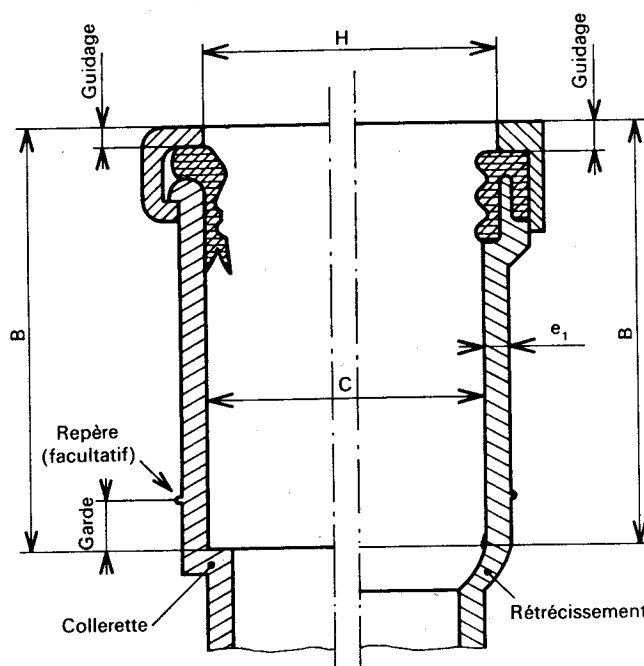


Figure 2 - Emboîture et bague de joint

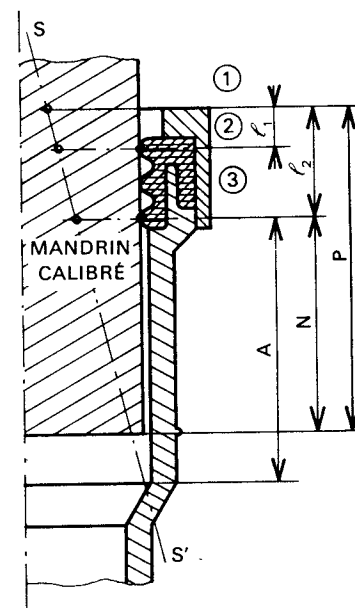


Figure 4 - Utilisation du mandrin calibre (ou calibre)

**Diagram taken from Standard NF T 54 031, withdrawn on June 2002**

These diagrams are provided for informational purposes regarding the shape of the seal; other designs may be considered.

Reuse the previous tables concerning outlet fittings for solvent welding assembly, replacing the information relating to the sockets with the below specifications.

In particular, in the case of expansion sleeves, the dimensions of the spigots are those of the fittings for solvent welding.

Maximum offset 6°.

Nominal diameter	Average internal diameters		Depth			
	of sockets (minimum)	Guiding H tolerances: + 1.6 0	Socket maximum	Chamber minimum	Chamber penetration minimum	Minimum thickness of walls
D	C		B	A	N	(th)
32	32.3	32.3	115	65	50	2.0
40	40.3	40.3	115	65	50	2.0
50	50.3	50.3	115	65	50	2.0
63	63.3	63.3	115	65	50	2.0
75	75.3	75.3	115	65	50	2.3
90	90.3	90.3	115	65	50	2.3
100	100.4	100.4	115	65	50	2.3
110	110.4	110.4	115	65	50	2.4
125	125.4	125.4	115	65	50	2.4
140	140.5	140.5	115	65	50	2.4
160	160.5	160.5	115	65	50	2.4
200	200.5	200.5	115	65	50	2.9
250	250.5	250.5	115	65	50	3.7

The corresponding assembly dimensions are not standardised and are thus left to the manufacturer. They cannot be less than those of the fittings for solvent welding assembly.

## Part 2. APPLICANT/HOLDER QUALITY REQUIREMENTS

### 2.1 QUALITY CONTROL OPTION

The tests specified in these tables are to be performed with the number of specimens stipulated in the testing standards and addendums indicated in Technical Document 1 of this certification reference system specific to each product group, unless otherwise indicated in the tables.

**For pipes:**

Table 6

Measurements or tests (1)	Minimum sampling frequency	Solid-wall PVC
Dimensions: diameter, thickness, out-of-roundness Appearance Colour Marking	By extruder: 1 every 4 hours	X
Density	1 test per month on 1 type at random (1)	X
Vicat softening temperature	1 test every 3 months on 1 type at random (1)	X
Tensile properties	By extruder: 1 test per campaign (1) (3) (4)	X
Reversion	1 test on 1 specimen at the start of the campaign (2) (3) (1)	X
Impact resistance	1 test per campaign (2) (3)	X

- (1) Methods specified in Technical Document 1 part 2.
- (2) Campaign: for each extruder, the period between the start of manufacturing of a product reference number and the switch to the next number.
- (3) Complete this test at least once a week (if the campaign lasts more than a week).
- (4) Test to be completed on at least 5 specimens.

**For fittings:**

**TABLE 7**

<b>Measurements or tests (1)</b>	<b>Minimum sampling frequency</b>
Dimensions (spigots and sockets)	Injected fittings: - per machine, per type and per dimensions: . Once every 4 hours, with increased inspections at the start of the campaign (2 specimens during the first 2 hours of production) (2)
Density	Injected fittings: 1 test per month on 1 type at random
Vicat softening temperature	Injected fittings: 1 test every 3 months on 1 type at random
Oven test	1 test on 1 specimen per day, per machine, per type and per dimensions (2)

(1) Methods specified in Technical Document 1, Part 2.

(2) 1 specimen corresponding to as many fittings (cavities) as the mould used contains.

A campaign corresponds to the period between the start of manufacturing of a product reference number and the switch to the next number.

## 2.2 QUALITY MANAGEMENT OPTION

The implemented quality assurance plan must enable product compliance with the specifications of the standards and of this regulation.

Consequently, the manufacturer must complete or ensure completion of the specified tests per the frequencies defined in the quality assurance plan, certain tests being able to be considered "type" tests (for putting new equipment in place or using a new formulation, for example).

The dimensional quality control testing carried out on the same fittings from TD2 of this reference system are deemed to satisfy the dimensional verifications of this reference system.

## Part 3. MONITORING ARRANGEMENTS BY CSTB

### 3.1 TEST PROCEDURES DURING AN APPLICATION FOR ADMISSION

**For pipes in the Discharge family – Solid-Wall PVC pipes for rainwater intended for siphonic systems:**

**TABLE 8**

Measurement or test	Tests conducted in the factory	Tests conducted in the laboratory
Average external diameter* Appearance Marking Colour Length Any diameter Thickness Sockets (depth of groove)	All the types submitted for admission	-
Density (1)	1 test (choice of type and category)	1 test
Vicat softening temperature (1)	1 test (choice of type and category)	1 test
Tensile characteristics (maximum stress and elongation at break) (1)	1 test (choice of category), except in the case where this test is a type test	1 test per type sampled
Reversion at 150°C (1)	1 test (choice of category)	1 test per type sampled
Impact resistance (1) NF EN 744	1 test	1 test per type sampled

(1) With additional clarifications indicated in **Technical Document 1, Part 2**.

(\*) Case of manufacturers holding the NF Mark TD2: the range admitted in TD6 being geometrically identical to the range admitted in TD2, inspection of dimensions will not be performed. Only the TD6 range not matching TD2 will be inspected; this TD6 range is distinguished by angles and Z- and H-lengths different from those of TD2. A list of this range shall be made available in the factories during an audit by the certification body.

**For fittings in the Discharge family – Solid-Wall PVC fittings for rainwater intended for siphonic systems:**

**TABLE 9**

<b>Measurement or test</b>	<b>Tests conducted in the factory</b>	<b>Tests conducted in the laboratory</b>
Average external diameter** Appearance Marking Colour Thickness Assembly dimension Sockets	All the types submitted for admission: by dimensional inspection of stock on at least half the range presented and by verification of the inspection registers for the entire range	-
Vicat softening temperature (1)	1 test	1 test
Density (1)	1 test	1 test
Oven test at 150°C (1)	1 test per fitting sampled (*)	1 test per fitting sampled (*)
Leaktightness under negative pressure	-	1 test on 1 expansion sleeve
Quality of elastomer sealing rings	-	1 report of tests provided by the manufacturer of elastomer sealing rings.

(1) With additional clarifications indicated in Technical Document 1, Part 2.

(\*): Limited to 4 fittings.

(\*\*) Case of manufacturers **holding the NF Mark** TD2: the range admitted in TD6 being geometrically identical to the range admitted in TD2, inspection of dimensions will not be performed. Only the TD6 range not matching TD2 will be inspected; this TD6 range is distinguished by angles and Z- and H-lengths different from those of TD2. A list of this range shall be made available in the factories during an audit by the certification body.



## 3.2 TEST PROCEDURES DURING MONITORING OF CERTIFIED PRODUCTS

**For pipes in the Discharge family – Solid-Wall PVC pipes for rainwater intended for siphonic systems:**

**TABLE 10**

Measurement or test	Tests conducted in the factory		Tests conducted in the laboratory
	Quality control	Quality management	
Average external diameter Appearance Marking Colour Length Any diameter Thickness Sockets (depth of groove)	5 types per visit divided between each family admitted and product category		-
Density (1)	Inspection of test records		1 type per year
Vicat softening temperature (1)	Inspection of test records		1 type per year
Tensile characteristics (maximum stress and elongation at break) (1)	Inspection of test records		1 type per year
Reversion at 150°C (1)	1 type at each visit (choice of category)	1 type per year (choice of category)	1 type per year
Impact resistance (1) NF EN 744	1 type at each visit (choice of category)	1 type per year (choice of category)	1 type per year

(1) With additional clarifications indicated in Technical Document 1, Part 2.

**For fittings in the Discharge family – Solid-Wall PVC fittings for rainwater intended for siphonic systems:**

**TABLE 11**

Measurement or test	Quality control		Quality management
	Quality control	Quality management	
Appearance (2) Marking Colour Average external diameter Any diameter Thickness of the fitting's body	3 diameters per visit and per category (choice of type)		-
Sockets	3 diameters per visit and per category (choice of type)		-
Vicat softening temperature (1)	Inspection of test records		1 diameter per year
Density (1)	Inspection of test records		1 diameter per year
Oven test at 150°C (1)	3 diameters per visit (choice of type and category)	3 diameters per year (choice of type and category)	1 diameter per year
Leaktightness under negative pressure	-	-	1 test on 1 expansion sleeve

(1) With additional clarifications indicated in Technical Document 1, Part 2.

(2) Case of manufacturers **holding the NF Mark** TD2: the range admitted in TD6 being geometrically identical to the range admitted in TD2, inspection of dimensions will not be performed. Only the TD6 range not matching TD2 will be inspected; this TD6 range is distinguished by angles and Z- and H-lengths different from those of TD2. A list of this range shall be made available in the factories during an audit by the certification body.