

**Certification programme ZP  
“Zertifizierungsprogramm” 8111  
of DVGW CERT GmbH, Bonn**

**Polyethylen Piping Systems according to  
DIN EN 1555 for the Gas Supply**

Doc. type	ZP
Author	DVGW CERT GmbH
Status	04.11.2024

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## 0 Preliminary remark

This certification programme (ZP) applies to plastic piping systems made of polyethylene (PE) in accordance with DIN EN 1555 for gas supply. It is applicable to pipes, fittings and valves made of PE and other materials, their connections to each other and connections to pipework components made of other materials with a maximum allowable operating pressure (MOP) of 10 bar for operating temperatures between -20 °C and 40 °C. The ZP includes tapping valves with service shut-off in accordance with DIN 3588-1 and plastic pipework systems for close-fit lining in accordance with DIN EN ISO 11299-3.

The certification programme describes the general requirements for the plastic piping system, the initial inspection of the production facility, the type testing of the product and the internal and external surveillance. It also describes supplementary tests that are required in order to certify products already certified in accordance with DVGW work sheet GW 335 in accordance with the test principles described here.

The size classes / production groups of DIN CEN/TS 1555-7 apply to pipes and their joints.

*Table 1: Production groups for pipes and connections*

Production group	Nominal diameter $d_n$ [mm]
1	$d_n < 75$
2	$75 \leq d_n < 250$
3	$250 \leq d_n < 710$
4	$710 \leq d_n \leq 800$

The connection methods and the associated fitting types are listed in Table 2.

*Table 2: Allocation of the fitting types to the fitting groups / connection methods*

Moulding groups	Connection method	Moulding types
(A)	Electrofusion sockets	Sockets, 45° elbows, 90° elbows, T-pieces, reducers, end caps, transition connectors, etc.
(B)	Electrofusion welding saddle	Tapping valves with service shut-off, tapping valves (tapping tea) , tapping saddles, connection clamps, etc.
(C)	Fittings with weld ends	Sockets, 45° elbows, 90° elbows, T-pieces, reducers, end caps, transition connectors, etc.

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## 1 Certification procedure

Products Gas national (European non-harmonised area)

## 2 Accreditations

An accreditation No. D-ZE-16028-01 exists for the procedure at German accreditation body (die Deutsche Akkreditierungsstelle GmbH) (DAkkS), Berlin.

## 3 Certification marks

DVGW resp. DIN-DVGW certification mark Products



Registration number scheme:

DG-8111DP0001      resp.      NG-8111DP0001

DG    = DVGW certification mark for gas,

NG    = DIN-DVGW certification mark for gas,

8111   = product code, DP = 2024, 0001 = serial no.

## 4 Type of certificate and Test Procedure

Type Testing Certificate (5-year term)

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## 5 Scope

The following tables contain the product codes within the scope of the ZP for the classification of components.

Table 3: Product codes of PE pressure pipes within the scope of the ZP

Product group	Product code	Product type
Plastic pressure pipes for supply lines	81 07	PE pipes (monolayer) for gas supply, Finished size 1 ( $d_n < 75$ mm)
	81 12	PE pipes (monolayer) for gas supply, Finished size 2 ( $75 \text{ mm} \leq d_n < 250$ mm)
	81 71	PE pipes (monolayer) for gas supply, Finished size 3 ( $250 \text{ mm} \leq d_n < 710$ mm)
	81 74	PE pipes (monolayer) for gas supply, Fert. size 4 ( $710 \text{ mm} \leq d_n \leq 800$ mm)
	81 08	PE pipes with coextruded layers (multilayer) for gas supply, finished size 1 ( $d_n < 75$ mm)
	81 13	PE pipes with coextruded layers (multilayer) for gas supply, finished size 2 ( $75 \text{ mm} \leq d_n < 250$ mm)
	81 72	PE pipes with coextruded layers (multilayer) for gas supply, finished size 3 ( $250 \text{ mm} \leq d_n < 710$ mm)
	81 75	PE pipes with coextruded layers (multilayer) for gas supply, finished size 4 ( $710 \text{ mm} \leq d_n \leq 800$ mm)
	81 09	PE pipes with removable additional layer (protective layer) for gas supply, size 1 ( $d_n < 75$ mm)
	81 14	PE pipes with removable additional layer (protective layer) for gas supply, finished size 2 ( $75 \text{ mm} \leq d_n < 250$ mm)
	81 73	PE pipes with removable additional layer (protective layer) for gas supply, size 3 ( $250 \text{ mm} \leq d_n < 710$ mm)
	81 76	PE pipes with removable additional layer (protective layer) for gas supply, finished size 4 ( $710 \text{ mm} \leq d_n \leq 800$ mm)
Plastic pressure pipes for underground pipes	84 31	Plastic pipes for the relining process of gas pipes, DN < 250 mm
	84 33	Plastic pipes for the relining of gas pipes, DN from 250 mm

$d_n$  = Nominal outside diameter of the PE pipes in mm

DN= inner diameter of the old pipe to be rehabilitated in mm

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Table 4: Product codes of the fittings within the scope of the ZP

Product group	Product code	Product type
Moulded parts made from plastics	86 02	PE-HD moulded parts with welding ends for -HS/HM welding <sup>1)</sup> , finish size 1 ( $d_n < 75$ mm)
	86 07	PE-HD fittings with welding end for -HS/HM welding <sup>1)</sup> , finished size 2 ( $75 \text{ mm} \leq d_n < 250$ mm)
	86 12	PE-HD fittings with welding end for -HS/HM welding <sup>1)</sup> , size 3 ( $250 \text{ mm} \leq d_n < 710$ mm)
	86 09	PE-HD fittings with welding end for -HS/HM welding <sup>1)</sup> , finished size 4 ( $710 \text{ mm} \leq d_n \leq 800$ mm)
	86 03	PE-HD electrofusion fittings <sup>1)</sup> , Finished size 1 ( $d_n < 75$ mm)
	86 08	PE-HD electrofusion fittings <sup>1)</sup> , Finished size 2 ( $75 \text{ mm} \leq d_n < 250$ mm)
	86 13	PE-HD electrofusion fittings <sup>1)</sup> , Finished size 3 ( $250 \text{ mm} \leq d_n < 710$ mm)
	86 10	PE-HD electrofusion fittings <sup>1)</sup> , Fert. size 4 ( $710 \text{ mm} \leq d_n \leq 800$ mm)

HS welding = heated tool butt welding

HM welding = electrofusion welding

$d_n$  = Nominal outside diameter of the PE pipes in mm

1) For fittings, connectors or valves used in gas and water supply, a gas/water type testing certificate can be issued using the product codes in Table 4, if the requirements of the certification programme ZP 8141 "Polyethylene piping systems according to DIN EN 12201 for water supply and for drainage and waste water pressure pipes" are also met.

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Table 5: Product codes of the material transition and clamping connectors in the ZP application area

Product group	Product code	Product type
Material transition connector	75 21	Metal transition connectors for gas pipes made of PE, PEX with pipes made of other materials <sup>2)</sup>
	75 23	Plastic transition connectors for gas pipes made of PE, PEX with pipes made of other materials <sup>3)</sup>
Clamp connectors made from plastics	86 04	PE-HD moulded parts for mechanical connections, finished size 1 ( $d_n < 75$ mm)
	86 05	PE-HD fittings for mechanical connections, finished size 2 ( $75 \text{ mm} \leq d_n < 250$ mm)
	86 18	PE-HD fittings for mechanical connections, finished size 3 ( $250 \text{ mm} \leq d_n < 710$ mm)
	86 19	PE-HD fittings for mechanical connections, finished size 4 ( $710 \text{ mm} \leq d_n \leq 800$ mm)

$d_n$  = Nominal outside diameter of the PE pipes in mm

Table 6: Product codes of the fittings within the scope of the ZP

Product group	Product code	Product type
Gas fittings	43 94	Shut-off fitting made of PE-HD, Finished size 1 ( $d_n < 75$ mm)
	43 75	Shut-off fitting made of PE-HD, Finished size 2 ( $75 \text{ mm} \leq d_n < 250$ mm)
	43 76	Shut-off fitting made of PE-HD, Finished size 3 ( $250 \text{ mm} \leq d_n < 400$ mm)
Piping parts and accessories	45 11	Tapping fitting for pipes made of PE-HD, outlet: finished size 1 <sup>4)</sup>

$d_n$  = Nominal outside diameter of the PE pipes in mm

## 6 Testing laboratories

Testing laboratories accredited in accordance with EN ISO/IEC 17025 for the relevant test bases and contractually bound to DVGW CERT GmbH.

2) DVGW G 5600-1 must be observed

3) DVGW G 5600-2 must be observed

4) DIN 3588 Part 1 and 3 (gas) must be observed for the service shut-off

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## 7 Requirements

### 7.1 Mechanical requirements:

The corresponding chapters of the

- DIN EN 1555-2 for pipes,
- DIN EN 1555-3 for fittings,
- DIN EN 1555-4 for fittings,
- DIN 3588-1 for shut-off valves with service shut-off,
- DVGW G 5600-1 for material transition connectors made of metal,
- DVGW G 5600-2 for material transition connectors made of plastic,
- DIN EN ISO 11299-1 and -3 with EN 1555 as reference for close fit plastic pipework systems,

in conjunction with DIN EN 1555-1 for the moulding compound<sup>5)</sup>, DIN EN 1555-5 for the suitability for use of the system and DIN CEN/TS 1555- 7 or DIN 3588-3 for assessing conformity.

### 7.2 Requirements for the Colouring of Pipes

The RAL colours listed in the national preface to DIN EN 1555-2 in accordance with the following table are national preferences for pipe colouring in Germany.

PE pipes with a peelable outer layer have green longitudinal stripes in addition to the standardised coloured outer layer according to national preference.

*Table 7: Colouring of gas pipes in Germany*

Pipes	Strip	Peelable outer layer	Co-extruded outer layer
PE 80 gelb RAL 1018	-	-	-
PE 80 black RAL 9004	yellow RAL 1018	yellow RAL 1018	yellow RAL 1018
PE 80 orange RAL 1033	-	-	-
PE 80 black RAL 9004	Orange RAL 1033	Orange RAL 1033	Orange RAL 1033

The following applies to export markets, provided there are no country-specific preferences:

The pipes must be black (PE 80, PE 100 and PE 100-RC), yellow (PE 80) or orange (PE 100 and PE 100-RC). In addition, black PE 80 pipes may be identified with yellow stripes and black PE 100 and PE 100-RC pipes with yellow or orange coloured stripes, depending on national preference.

The co-extruded outer layer of co-extruded pipes or the peelable outer layer of pipes with peelable layers must be either black, yellow or orange. In addition, identification strips may be used depending on national preference.

5) The conformity of the moulding compounds with the requirements of DIN EN 1555-1 can be confirmed by certification from DIN CERTCO Gesellschaft für Konformitätsbewertung mbH and is published in the KRV list of materials "Certified plastics for pressure pipes and fittings" ([www.krv.de](http://www.krv.de)).



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### 7.3 Requirements for product documentation

For testing and certification, the manufacturer must submit complete product documentation in German or English with the following scope:

- Drawings with dimensions and tolerances,
- Production group,
- Parts lists with material specifications, material certificates, installation instructions, operating instructions, labelling, etc,
- Welding parameters and cooling time,
- for fittings with electrofusion welding: nominal value of the electrical resistance or welding code for automatic weld detection according to ISO 13950, materials and dimensions of the connection joint,
- Quality inspection plan of the in-process inspections for the products concerned (see chapter 9.2).

## 8 Initial inspection of the production facility

Before the type testing certificate is issued, an initial inspection of the manufacturing facility must be carried out. The inspector appointed by the certification body must satisfy himself that the manufacturer has the personnel and equipment to ensure that the components are manufactured and monitored properly at all times. A test report must be drawn up for this purpose. Existing test reports that have been carried out, e.g. as part of surveillance or UBA-BWGL audits on similar products at the manufacturer's plant, can be recognised.

The documentation for the tests listed in CEN/TS 1555-7, Table 4 for pipes, Table 5 for fittings and Table 6 for valves in the "Manufacturer" column must be randomly checked during the initial inspection of the production facility.

## 9 Testings

### 9.1 Type testing (type testing)

The scope of the tests for the component and system is specified by the conditions N, E, M, D, D1, D2<sup>6)</sup> :

- for initial certification (N) , <sup>6)</sup>
- for the extension of the certification by manufacturing groups (E) , <sup>6)</sup>
- when changing the moulding compound (M) , <sup>6)</sup>
- in the event of a change to the design / version (D, D1, D2) , <sup>6)</sup>
- in the event of changes to the manufacturing process that go beyond the usual internal process settings or adjustments,
- when changing the production location.

<sup>6)</sup> Nomenclature according to Tables 4 to 6 of CEN/TS 1555-7

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The scope of testing is then determined for

- Pipes in CEN/TS 1555-7, Table 4,
- Fittings in CEN/TS 1555-7, Table 5 , <sup>7)</sup>
- Fittings in CEN/TS 1555-7, Table 6,
- Tapping valves with service shut-off according to DIN 3588-3,
- Metal material transition connectors in accordance with DVGW G 5600-1 and
- Material transition connector made of plastic according to DVGW G 5600-2.
- For the initial certification of close fit piping systems according to ISO 11299-3, all test results in the column "ISO 11299-3" in Annex A2 must be submitted. In addition, Table 4 of CEN/TS 1555-7 applies if applicable to close fit piping systems.

The manufacturer shall commission a test centre that meets the requirements of Chapter 6 of this certification scheme to carry out the type test. The scope of the tests is defined according to the "sampling procedure" in accordance with CEN/TS 1555-7, Tables 4, 5 and 6. As a rule, the manufacturer sends test samples to the test centre commissioned to carry out the type test. Alternatively, samples can be taken by the test centre in consultation with the manufacturer.

The test centre carries out the tests in accordance with the "Certification body" column in Tables 4, 5 and 6 of CEN/TS 1555-7 and prepares a type test report for this purpose. Existing type test, supplementary test and control test reports in accordance with GW 335A2 -for pipes or GW 335B2 -for fittings can be recognised -for type testing in accordance with DIN EN 1555 if no changes have been made to the component and system, the production process or the test basis in the meantime. -The following time limits apply to the recognition of reports in accordance with GW 335A2 -or -B2:

- The last type testing report must not be older than 15 years.
- Supplementary test reports must not be older than the last type testing report.
- Control test reports must not be older than 5 years.

If reports on the type, supplementary or control test of an existing certification in accordance with GW 335-A2 or B2 are taken into account for the type test in accordance with DIN EN 1555, the interval until the next complete type test (15 years) is transferred to the certificate in accordance with DIN EN 1555.

Supplementary tests for pipes -certified to GW 335A2 -are specified in Annex A1 of this ZP. The scope of testing for the certification of close fit pipes in accordance with DIN EN ISO 11299-3 is described in Annex A2. The supplementary tests for fittings certified in accordance with GW 335B2 -are listed in Annex B.

<sup>7)</sup> For fittings used in gas and water supply, a gas/water type testing certificate can be issued using the product codes in Table 2, if the requirements of DIN EN 12201 according to "ZP 8141 Polyethylene piping systems according to DIN EN 12201 for water supply and for drainage and waste water pressure pipes" are also fulfilled and a valid confirmation of conformity hygiene according to the UBA "Recommendation for confirmation of conformity of the drinking water hygiene suitability of products" is available or has been applied for.

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## 9.2 Production control by the manufacturer (self-surveillance)

The manufacturer must carry out its own production checks in such a way that a reliable assessment of production is possible. The manufacturer shall draw up a quality inspection plan for this purpose. The inspections in accordance with the quality inspection plan must be documented. The documentation must be kept accessible for surveillance inspection (external surveillance).

### 9.2.1 Batch release tests (BRT - release test)

The scope and frequency of the tests of components for the release test (BRT) are as follows

- for pipes according to CEN/TS 1555-7, Table 8,
- for fittings according to CEN/TS 1555-7, Table 9 and
- for fittings according to CEN/TS 1555-7, Table 10,
- for tapping valves with service shut-off according to DIN 3588-3.
- In addition to Table 8 of CEN/TS 1555-7, the resilience requirement (memory effect) for close fit pipes must be verified in accordance with Section 5.6 and Annex A of DIN EN ISO 11299-3 on 3 pipe sections with a minimum length of 50 mm per batch.

To determine the properties listed in Tables 8 to 10 of CEN/TS 1555-7, indirect tests may be carried out as part of the batch release test. The correlation between the original and the indirect test procedure must be documented and updated.

### 9.2.2 Process Verification Tests (PVT)

The scope and frequency of the process verification (PVT) are carried out for

- Pipes according to CEN/TS 1555-7, Table 12,
- Fittings according to CEN/TS 1555-7, Table 13 and
- Fittings according to CEN/TS 1555-7, Table 14.

A test that has been carried out as a surveillance test (audit test) as part of external surveillance does not have to be repeated as a process test.

## 9.3 Surveillance test / audit test (AT - external surveillance)

The task of external surveillance is to check the manufacturer's own surveillance on the basis of its organisation and records and to verify the conformity of the manufactured product with the original type.

The scope and frequency of the tests of components for the surveillance test (AT) are carried out for

- Pipes according to CEN/TS 1555-7, Table 16,
- Fittings according to CEN/TS 1555-7, Table 17 and
- Fittings according to CEN/TS 1555-7, Table 18.

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- In addition to Table 16 of CEN/TS 1555-7, the resilience requirement (memory effect) for close fit pipes must be verified in accordance with Section 5.6 and Annex A of DIN EN ISO 11299-3 for each 3 pipe sections with a minimum length of 50 mm:
  - annually on one diameter each of production group 2 and
  - annually on one diameter of each of the production group 3.

Samples are usually taken by an authorised representative of the test centre at the manufacturer's production facility or central warehouse.

The provisions described in the "Rules of procedure for the certification of products in the non-harmonised area" of DVGW CERT GmbH (hereinafter referred to as DVGW CERT rules of procedure) in the section "Surveillance procedure" apply. The "Control test" procedure is to be used for this certification programme.

## 10 Labelling

Labelling is carried out in accordance with the specifications of the applicable product standards in the "Labelling" section, as well as supplementary requirements from the DVGW CERT rules of procedure in the "Labelling" section.

## 11 Applicable documents

In the case of undated references, the current edition of the following documents applies.

- DVGW CERT GmbH <40014> Geschäftsordnung der DVGW CERT GmbH zur Zertifizierung von Produkten im nicht harmonisierten Bereich
- DVGW CERT GmbH <58141> Zertifizierungsprogramm ZP 8141 „Rohrleitungssysteme aus Polyethylen nach DIN EN 12201 für die Wasserversorgung und für Entwässerungs- und Abwasserdruckleitungen
- DVGW GW 335-A2:2005-11  
Kunststoff-Rohrleitungssysteme in der Gas- und Wasserverteilung - Anforderungen und Prüfungen - Teil A2: Rohre aus PE 80 und PE 100
- DVGW GW 335-A2-B1:2010-12  
Beiblatt 1 zu DVGW-Arbeitsblatt GW 335-A2:2005-11: Kunststoff-Rohrleitungssysteme in der Gas- und Wasserverteilung - Anforderungen und Prüfungen - Teil A2: Rohre aus PE 80 und PE 100
- DVGW GW 335-B2:2004-09  
2. Beiblatt zum DVGW-Arbeitsblatt GW 335 - Kunststoff-Rohrleitungssysteme in der Gas- und Wasserverteilung - Anforderungen und Prüfungen - Teil B2: Formstücke aus PE 80 und PE 100
- DVGW GW 335-B2-B1:2013-02  
1. Beiblatt zu DVGW-Arbeitsblatt GW 335-B2:2004-09 - Kunststoff-Rohrleitungssysteme in der Gas- und Wasserverteilung; Anforderungen und Prüfungen - Teil B2: Formstücke aus PE 80 und PE 100

- DVGW G 5600-1:2013-10  
DVGW G 5600-1 Korrektur:2014-02  
Werkstoffübergangsverbinder aus Metall für Gasrohrleitungen aus Polyethylen - Anforderungen und Prüfungen
- DVGW G 5600-2:2015-09  
Werkstoffübergangsverbinder aus Kunststoff für Gasrohrleitungen aus Polyethylen - Anforderungen und Prüfungen
- DIN 3588-1:2021-11  
Gas-Anbohrarmaturen - Teil 1: Mit Betriebsabspernung für Polyethylen-Rohrleitungen - Anforderungen und Prüfungen
- DIN 3588-3:2021-11  
+ Warnvermerk 2024-10-10  
Gas-Anbohrarmaturen - Teil 3: Konformitätsbewertung
- DIN EN 1555- :2021-12  
Kunststoff-Rohrleitungssysteme für die Gasversorgung - Polyethylen (PE) -
  - Teil 1: Allgemeines
  - Teil 2: Rohre
  - Teil 3: Formstücke
  - Teil 4: Armaturen
  - Teil 5: Gebrauchstauglichkeit des Systems
- DIN CEN/TS 1555-7: 2022-03  
Kunststoff-Rohrleitungssysteme für die Gasversorgung - Polyethylen (PE) - Teil 7: Empfehlungen für die Beurteilung der Konformität.
- DIN EN ISO 11299-1: 2019-04  
Kunststoff-Rohrleitungssysteme für die Renovierung von erdverlegten Gasversorgungsnetzwerken - Teil 1: Allgemeines
- DIN EN ISO 11299-3: 2019-04  
Kunststoff-Rohrleitungssysteme für die Renovierung von erdverlegten Gasversorgungsnetzwerken - Teil 3: Close-Fit-Lining
- ISO 4437- :2024-02  
Rohrleitungssysteme aus Kunststoffen für die Versorgung mit gasförmigen Brennstoffen - Polyethylen (PE)
  - Teil 1: Allgemeines
  - Teil 2: Rohre
  - Teil 3: Formstücke
  - Teil 4:2022-11: Armaturen
  - Teil 5: Gebrauchstauglichkeit des Systems
- ISO 13950:2007-03  
Rohre und Formstücke aus Kunststoffen - Automatische Erkennungssysteme für Heizweldschweißverbindungen
- KRV-Werkstofflisten A bis F der zertifizierten Werkstoffe für Druckrohre und -formstücke sowie der zertifizierten Streifenwerkstoffe für Druckrohre, [www.krv.de](http://www.krv.de)
- EN ISO/IEC 17025: Allgemeine Anforderungen an die Kompetenz von Prüf- und Kalibrierlaboratorien

## 12 Period of validity

This certification programme is valid from 04.11.2024.

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### 13 Annex A1 (informative): Supplementary tests for pipes certified according to DVGW GW 335-A2

Comparison of type testing/type testing of PE pipes according to DVGW GW 335- A2:2005-11, Table 7 and DVGWG 335-A2-B1:2010-12 vs. DIN CEN/TS 1555- 7:2022- 03, Table 4.

The additional scope of testing can be seen **x +** in the fields labelled with .

Standard	DVGW GW 335-A2 (-B1) <sup>a)</sup>			DIN CEN/TS 1555-7				
	EC 1	EC 2	EC 3	FG 1	FG 2	FG 3	FG 4	
Testings								
Requirements for the material	<b>x</b> (KRV listing required)			<b>x 0</b> (Requirements according to DIN EN 1555-1)				
Labelling	<b>x</b>	<b>x</b>	<b>x</b>	<b>x + <sup>b)</sup></b>				
Texture / surface finish	<b>x</b>	<b>x</b>	<b>x</b>	<b>x =</b>	<b>x =</b>	<b>x =</b>	<b>x +</b>	
Colour	<b>x</b>	<b>x</b>	<b>x</b>	<b>x =</b>	<b>x =</b>	<b>x =</b>	<b>x +</b>	
Dimensions	<b>x</b>	<b>x</b>	<b>x</b>	<b>x =</b>	<b>x =</b>	<b>x =</b>	<b>x +</b>	
Hot storage DIN EN ISO 2505	<b>x</b>	<b>x</b>	<b>x</b>	<b>x =</b>	<b>x =</b>	<b>x = <sup>c)</sup></b>	<b>- 0</b>	
Homogeneity ISO 18553	<b>x</b>	<b>x</b>	<b>x</b>	<b>- 0</b>	<b>- 0</b>	<b>- 0</b>	<b>- 0</b>	
Creep rupture test (80 °C / 165 h) DIN EN ISO 1167-1/-2	<b>x <sup>d)</sup></b>	<b>x <sup>d)</sup></b>	<b>x <sup>d)</sup></b>	<b>- 0</b>	<b>- 0</b>	<b>- 0</b>	<b>- 0</b>	
Creep rupture test (80 °C / 1,000 h) DIN EN ISO 1167-1/-2	-	-	-	<b>x +</b>	<b>x +</b>	<b>x +</b>	<b>x +</b>	
Creep rupture test (20 °C / 100 h) DIN EN ISO 1167-1/-2	-	-	-	<b>x +</b>	<b>x +</b>	<b>x +</b>	<b>x +</b>	
Melt flow rate (MFR) DIN EN ISO 1133-1	<b>x</b>	<b>x</b>	<b>x</b>	<b>x + <sup>e)</sup></b>	<b>x + <sup>e)</sup></b>	<b>x + <sup>e)</sup></b>	<b>x + <sup>e)</sup></b>	
Elongation at break/elongation at break DIN EN ISO 6259-1/-3	<b>x</b>	<b>x</b>	<b>x</b>	<b>x =</b>	<b>x =</b>	<b>x =</b>	<b>x +</b>	
Delamination/layer separation (only for coextruded pipes)	-	-	-	<b>x +</b>	<b>x +</b>	<b>x +</b>	<b>x +</b>	
Changing the diameter of pipe ends	-	-	-	-	-	<b>x +</b>	<b>x +</b>	
Resistance to slow crack growth with PE 80 and PE 100		NPT DIN EN ISO 13479	-	-	-	<b>x <sup>f)</sup></b>	<b>x +</b>	<b>x +</b>
Resistance to slow crack growth with PE 100-RC		SHT ISO 18488	-	-	-	<b>x +</b>	-	-
		ANPT DIN EN ISO 13479	-	-	-	-	<b>x +</b>	-
		CRB ISO 18489	-	-	-	-	-	<b>x +</b>
Resistance to rapid crack propagation S4 Test DIN EN ISO 13477	-	-	-	<b>x + <sup>g)</sup></b>				
Oxidation induction time (thermal Stability) DIN EN ISO 11357-6	-	-	-	<b>x + <sup>e)</sup></b>	<b>x + <sup>e)</sup></b>	<b>x + <sup>e)</sup></b>	<b>x + <sup>e)</sup></b>	
Weather resistance DIN EN ISO 16871	-	-	-	<b>x + <sup>h)</sup></b>				
Tensile strength of butt-welded joints	-	-	-	-	<b>x + <sup>b)</sup></b>	-	-	
Squeezing DIN EN 12106	-	-	-	<b>x + <sup>b)</sup></b>				
Structural integrity after deformation (only for coextruded pipes)	-	-	-	<b>x +</b>	<b>x +</b>	<b>x +</b>	<b>x +</b>	

EC Product group  
FG Production group

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**Legend:**

<b>x</b>	A requirement is specified in the standard.
<b>-</b>	No requirement is specified in the standard.
<b>=</b>	The requirements specified in both standards are identical. No additional tests are required.
<b>0</b>	There are differences between the two standards, but no additional tests are required tests are required because, for example, no or fewer requirements are specified in DIN CEN/TS 1555- 7.
<b>+</b>	There are differences between the two standards that require additional testing.

Further information on tests is specified in the following footnotes.

**Footnotes:**

- a) for initial production: tests on two different production batches (dimensions or time periods)
- b) Checking the manufacturer's results
- c) applies to wall thicknesses  $\leq 16$  mm
- d) For initial production: proof of representative sample required (testing of at least 100 pipe samples)
- e) per shift
- f)  $e > 5$  mm
- g) Generally covered by proof of KRV listing
- h) Proof of the raw material manufacturer

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#### 14 Annex A2 (informative): Supplementary tests for close fit pipes (DIN EN ISO 112993-) certified -in accordance with DVGW GW 335 A2

Comparison of type testing/type testing of PE pipes (FG 2 and FG 3) based on DVGW GW 335 A2:2005-11, Table 7 and DVGW GW 335-A2-B1:2010-12 vs. close fit pipes (FG 2 and FG 3) according to DIN EN ISO 11299-3:2019-04 (FG 2 and FG 3) and DIN CEN/TS 1555- 7:2022-03, Table 4.

The additional scope of testing can be seen x + in the fields labelled with .

Standard		DVGW GW 335-A2 (-B1)		DIN EN ISO 11299-3		
		EC 2	EC 3	FG 2	FG 3	Section
<b>Testings</b>						
Requirements for the material		<b>x</b> (KRV listing required)		<b>x</b> (Requirements according to DIN EN 1555-1)		5.1 + 5.9 <sup>i)</sup>
Labelling		<b>x</b>		<b>x + <sup>i)</sup></b>		5.8 + 5.9 <sup>i)</sup>
Texture / surface finish		<b>x</b>		<b>x + <sup>k)</sup></b>		5.2.1 + 5.9 <sup>i)</sup> 8.2 + 8.9 <sup>o)</sup>
Colour		<b>x</b>		<b>x 0</b>		5.2.2 + 5.9 <sup>i)</sup>
Dimensions		<b>x</b>		<b>x + <sup>k)</sup></b>		5.4 + 5.9 <sup>i)</sup> 8.4 + 8.9 <sup>o)</sup>
Hot storage / longitudinal shrinkage according to DIN EN ISO 2505		<b>x</b>		<b>x + <sup>L)</sup></b>		5.6 + 5.9 <sup>i)</sup>
Creep rupture test (80 °C / 165 h) DIN EN ISO 1167-1/-2		<b>x</b>		<b>x + <sup>m or n)</sup></b>		5.5 + 5.9 <sup>i)</sup>
Creep rupture test (80 °C / 1,000 h) DIN EN ISO 1167-1/-2		-		<b>x + <sup>n)</sup></b>		8.5 + 8.9 <sup>o)</sup>
Creep rupture test (20 °C / 100 h) DIN EN ISO 1167-1/-2		-		<b>x + <sup>n)</sup></b>		8.5 + 8.9 <sup>o)</sup>
Melt flow rate (MFR) DIN EN ISO 1133-1		<b>x <sup>p)</sup></b>		<b>x + <sup>L), p)</sup></b>		5.3 + 5.9 <sup>i)</sup>
Elongation at break/elongation at break DIN EN ISO 6259-1/-3		<b>x</b>		<b>x + <sup>n)</sup></b>		8.5 + 8.9 <sup>o)</sup>
Delamination/layer separation (only for coextruded pipes)		-		<b>x + <sup>q)</sup></b>		(DIN EN 15552-, Annex A.7)
Resistance to slow crack growth with PE 80 and PE 100	NPT DIN EN ISO 13479	-		<b>x + <sup>n), r)</sup></b>		8.5 + 8.9 <sup>o)</sup>
Resistance to slow crack growth with PE 100-RC	SHT ISO 18488	-	-	-	-	8.5 + 8.9 <sup>o)</sup>
	ANPT DIN EN ISO 13479	-	-	<b>x + <sup>n), r)</sup></b>	-	8.5 + 8.9 <sup>o)</sup>
	CRB ISO 18489	-	-	-	<b>x + <sup>n), r)</sup></b>	8.5 + 8.9 <sup>o)</sup>
Resistance to rapid crack propagation S4 Test DIN EN ISO 13477		-		<b>x + <sup>s)</sup></b>		8.5 + 8.9 <sup>o)</sup>
Oxidation induction time (thermal Stability) DIN EN ISO 11357-6		<b>x <sup>p)</sup></b>		<b>x + <sup>L), p)</sup></b>		5.3 + 5.9 <sup>i)</sup>
Weather resistance DIN EN ISO 16871		-		<b>x + <sup>t)</sup></b>		(DIN EN 15551-, 5.2.3.2)



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Standard	DVGW GW 335-A2 (-B1)		DIN EN ISO 11299-3		
	EC 2	EC 3	FG 2	FG 3	Section
Testings					
Tensile strength of butt-welded joints	-		<b>x + <sup>u)</sup></b>		ISO 4437-5, 4 or DIN EN 1555-5, 5.2.2.1
Squeezing DIN EN 12106	-		<b>x + <sup>u)</sup></b>		(DIN EN 1555-5, 5.2.2.1)
Structural integrity after deformation (only for coextruded pipes)	-		<b>x +</b>		(DIN EN 1555-2- Annex A.8)
Resilience (memory effect)	-		<b>x + <sup>L)</sup></b>		5.6 + Appendix A

EC Product group  
FG Production group

#### Legend:

<b>x</b>	A requirement is specified in the standard.
<b>-</b>	No requirement is specified in the standard.
<b>=</b>	The requirements specified in both standards are identical. No additional tests are required.
<b>0</b>	There are differences between the two standards, but no additional tests are required because, for example, no or lower requirements are specified in DIN EN ISO 11299-3.
<b>+</b>	There are differences between the two standards that require additional testing.

Further information on tests is specified in the following footnotes.

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**Footnotes:**

- i) Checking the manufacturer's results
- j) According to DIN EN ISO 11299-3, section 5.9, the parts of ISO 4437 (e.g. ISO 4437-1, ISO 4437-2 and ISO 4437-5) specified as normative references in sections 5.1 to 5.8 are to be replaced by the corresponding parts of EN 1555 (EN 1555-1, EN 1555-2 and EN 1555-5) in countries of the European Single Market
- k) Testing of pipes in the "M" state (manufactured - as manufactured - folded) and pipes in the "I" state ("installed - as installed")
- L) Testing of pipes in "M" condition (manufactured - as manufactured - folded)
- m) Testing of "M-tubes" remoulded by heat
- n) Testing of pipes in "I" condition (installed - as installed)
- o) According to DIN EN ISO 11299-3, section 8.9, the parts of ISO 4437 (e.g. ISO 4437-2 and ISO 4437-5) specified as normative references in sections 8.1 and 8.5 are to be replaced by the corresponding parts of EN 1555 (EN 1555-2 and EN 1555-5) in countries of the European Single Market
- p) per shift
- q) Testing of the samples from the creep rupture test or the elongation at break test for delamination as part of the BRT
- r) In the NPT or ANPT, one of the 4 notches must be inserted into the remoulded fold of the pipe in the I-state<sup>8)</sup>
- s) One-off verification on freely selectable pipe samples in the "I" state that the reduction/re-forming process does not have a detrimental effect on the resistance to rapid crack propagation. The impact load in the S4 test is applied on the longitudinal axis of the remoulded fold of the pipe in the "I" state<sup>8)</sup>
- t) Proof of the raw material manufacturer
- u) Checking the manufacturer's results on a diameter

<sup>8)</sup> R. Glanert, J. Grieser: Trenchless close-fit installations in PE 100-RC quality, 3R international - Issue 06, 2014, page 24-26

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## 15 Appendix B (informative): Supplementary tests for fittings certified according to DVGW GW 335 B2

Comparison of type testing/type testing of moulded parts according to DVGW GW 335- B2:2004-09, Table 6 and DVGW GW 335-B2-B1:2013-02 vs. DIN CEN/TS 1555- 7:2022-03, Table 5.

For certification in accordance with this ZP, the scope of testing in accordance with DIN CEN/TS 1555-7 must be verified.

Standard	DVGW GW 335-B2 (-B1) <sup>v)</sup>	DIN CEN/TS 1555-7:2022-03	
<b>Testings</b>			<b>Scope of testing</b>
General information	x	x	5 moulded parts of one diameter per production group and group of moulded parts
Characteristics	x	x	
Surface finish	x	x	
Electrical properties	x	x	
Colour	x	x	
Dimensions	x	x	
Melt index	x	x	1 Sample / group of moulded parts
Hygiene	x	National requirements	-
Pressure drop	x	(for pressure tapping fittings)	By checking the manufacturer's test results. If these are not available, then: 1 moulding per diameter
Labelling	x	x	1 test specimen of a diameter / production group / moulding group / cavity
Creep rupture test	80°C / 165 h	20°C / 100 h	FG 1 and FG 2: 3 fittings of one diameter per production group and fitting group FG 3 and FG 4: 1 moulding of one diameter per production group and moulding group
	-	80°C /1000 h	
Peel resistance ISO 13954 or 13955 for sockets, ISO 13956 for saddle	PE 100 SDR 11 +23°C	PE 100 SDR maximum value +23°C, ISO 11413, Appendix C, condition 1	1 test specimen of a diameter / production group / moulding group / condition
	No test	PE 100 SDR minimum value +23°C, ISO 11413	

Standard	DVGW GW 335-B2 (-B1) <sup>v)</sup>	DIN CEN/TS 1555-7:2022-03	
Testings			Scope of testing
		Appendix C, condition 1	
	PE 100 SDR 11 -10°C	PE 100 SDR minimum value, Tmin, ISO 11413 Appendix C, condition 2	
	PE 100 SDR 17 -10°C	PE 100 SDR minimum value, Tmax, ISO 11413 Appendix C, condition 3	
	PE 80 SDR 17.6 +45°C	PE 80 on customer request	
	PE 100 SDR 11, +23°C angulation	No test	
Tensile strength of butt-welded joints	x	x	By checking the manufacturer's test results. If these are not available, then: 1 moulding per production group, moulding group and condition
	No test	PE 100 with PE 100 +23°C, ISO 14114, Annex B, Condition 1	
	No test	PE 100 with PE 100 -5°C, ISO 14114, Annex B, Bed. 2	
	No test	PE 100 with PE 100 +40°C, ISO 14114, Annex B, Bed. 3	
Impact stress	x	(for pressure tapping fittings)	1 moulded piece per diameter
Creep rupture tensile test	x	No test	-

v) Scope of testing in accordance with DVGW GW 335-B2: 2 productions (component types, dimensions or time periods) per product group, per material, component type and production site