

Certification Programme ZP 8141 of DVGW CERT GmbH, Bonn

Polyethylene Piping Systems according to DIN EN 12201 for the Water Supply



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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 12201 for water supply. It is applicable to pipes, fittings and valves made of PE and other materials, their connections to each other and to connections with pipework components made of other materials with a permissible component operating pressure (PFA) of up to 25 bar. The ZP includes water tapping valves with operational shut-off in accordance with DVGW W 336 and plastic piping systems for close-fit lining in accordance with DIN EN ISO 11298-3.

The dimension groups of FprCEN/TS 12201-7 apply to pipes and their connections.

Dimension group	Nominal diameter dn [mm]
1	d _n < 75
2	75 ≤ d _n < 250
3	250 ≤ d _n < 710
4	710 ≤ d _n < 1800
5	$1800 \le d_{(n)} \le 3000$

Table 1 : Dimension groups for pipes and connections

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

Moulding group	Connection method	Moulding type			
(A)	Electrofusion sockets	Electrofusion fittings, 45° elbows, 90° el- bows, T-pieces, reducers, sealing caps, etc.			
(B)	Electrofusion welding saddle	Electrofusion tapping fittings, electrofusion tapping saddles, etc.			
(C)	Fittings with weld end (moulded spigot)	45° bends, 90° bends, T-pieces, reducers, end caps, etc.			
(D)	Ready-made moulded piece	Pipe bends, segment bends, segment tees, etc.			

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

1 Certification Procedure

Products Water 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 or DIN-DVGW certification mark Products





Registration number scheme: DW-8141DQ0001 resp. NW-8141DQ0001

DW = DVGW certification mark for water,

NW = DIN-DVGW certification mark for water,

8141 = product code, DQ = 2025, 0001 = serial no.

4 Type of certificate and Test Procedure

Type examination certificate (5-year term)

5 Scope

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

Product group	Produc	t code	Product type
Plastic pressure pipes for supply lines	81	36	PE pipes (monolayer) for water supply, dimension group 1 ($d_n < 75$ mm)
	81	41	PE pipes (monolayer) for water supply, dimension group 2 (75 mm \leq d _n < 250 mm)
	81	46	PE pipes (monolayer) for the water supply,
			Dimension group 3 (250 mm \leq d _n $<$ 710 mm)
	81	81	PE pipes (monolayer) for the water supply,
			Dimension group 4 (710 mm $\leq d_n < 1800$ mm)
	81	86	PE pipes (monolayer) for the water supply,
			Dimension group 5 (1800 mm $\leq d_{(n)} \leq 3000$ mm)
Plastic pressure pipes for	81	38	PE pipes with co-extruded layers for water supply,
supply lines			dimension group 1 (d _n < 75 mm)
	81	43	PE pipes with co-extruded layers for water supply,
			dimension group 2 (75 mm≤ d _n < 250 mm)
	81	48	PE pipes with co-extruded layers for water supply,
			dimension group 3 (250 mm $\leq d_n < 710$ mm)
	81	82	PE pipes with co-extruded layers for water supply,
			dimension group 4 (710 mm≤ d _n < 1800 mm)

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



Product group	Product code	Product type
	81 87	PE pipes with co-extruded layers for water supply,
		dimension group 5 (1800 mm $\leq d_{(n)} \leq 3000$ mm)
	81 50	PE pipes with removable additional layer for water
		supply, dimension group 1 ($d_n < 75$ mm)
	81 52	PE pipes with removable additional layer for water
		supply, dimension group 2 (75 mm \leq d _n $<$ 250
		mm)
	81 54	PE pipes with removable additional layer for water
		supply, dimension group 3 (250 mm \leq d _n $<$ 710
		mm)
	81 83	PE pipes with removable additional layer for water
		supply, dimension group 4 (710 mm \leq d _n $<$ 1800
		mm)
	81 88	PE pipes with removable additional layer for water
		supply, dimension group 5 (1800 mm $\leq d_n \leq 3000$
		mm)
Plastic pressure pipes for	84 26	Plastic pipes for the relining of drinking water
underground pipes		pipes, diameter DN < 250 mm
	84 28	Plastic pipes for the relining of drinking water
		pipes, diameter DN from 250 mm

 d_n = Nominal outside diameter in mm

DN = Inner diameter of the old pipe to be rehabilitated

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Product group	Product code	Product type
Moulded parts made from	86 02	PE-HD fittings with welding ends for HS/HM weld-
plastics		ing ¹⁾ , dimension group 1 ($d_n < 75$ mm)
	86 07	PE-HD fittings with weld end for HS/HM welding ¹
), dimension group 2 (75 mm \leq d _n $<$ 250 mm)
	86 12	PE-HD fittings with weld end for HS/HM welding ¹
), dimension group 3 (250 mm \leq d _n $<$ 710 mm)
	86 09	PE-HD fittings with weld end for HS/HM welding ¹
), dimension group 4 (710 mm \leq d _n $<$ 1800 mm)
	86 60	PE-HD fittings with weld end for HS/HM welding ¹
), dimension group 5 (180 mm \leq d _n \leq 3000 mm)
	86 03	PE-HD electrofusion fittings ¹),
		Dimension group 1 (d _n < 75 mm)
	86 08	PE-HD electrofusion fittings ¹ , dimension group 2
		(75 mm ≤ d _n < 250 mm)
	86 13	PE-HD electrofusion fittings ¹ , dimension group 3
		(250 mm ≤ d _n < 710 mm)
	86 10	PE-HD electrofusion fittings ¹), dimension group 4
		(710 mm ≤ d _n < 1800 mm)
	86 61	PE-HD electrofusion fittings ¹), dimension group 5
		$(1800 \text{ mm} \le d_n \le 3000 \text{ mm})$

HS welding = heated tool butt welding

HM welding = electrofusion welding

Table 5 : Product	codes of the tapping	g shut-off valves in	n the application area	of the ZP

Product group	Product code	Product type
Gas and water	66 06	Water tapping stop valve for PE pipes, outlet:
Tapping fittings		dimension group1 ²)
	66 11	Gas/water tapping stop valve for PE pipelines,
		outlet: dimension group 1 ²)

Table 6 :	Product codes	for material	transition	connectors	in the	application	area of	the ZP
1 4010 0.	1 100000	ioi matomai	u anonuoni	001111001010		appnoadorr		

Product group	Product code	Product type
Material transition connector	75 01	Transition to PE for gas and drinking water pipes ¹)
	75 11	Transition to PE for drinking water pipes

²) DVGW W 336 must be observed for the shut-off

For fittings, connectors or valves used in gas and water supply, a gas/water type examination certificate can be issued using the product codes in Table 4, if the requirements of the certification programme ZP 8111 "Polyethylene piping systems according to DIN EN 1555 for gas supply" are also met.

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rable	<i>(</i>	PIOOLCI	CODES O	ппе	mmos	111111	e scode	ora	DOIICAIION	011111111111111111111111111111111111111	~
1 0.010			004000		nungo		000000	0, 0	ppnoadon	0, 1,0 -	

Product group	Product code	Product type
Fittings for the	62 10	Isolating valves made of PE
Water supply		

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.

7 Requirements

7.1 Mechanical requirements:

The corresponding chapters of the

- DIN EN 12201-2 for pipes,
- DIN EN 12201-3 for fittings,
- DIN EN 12201-4 for valves,
- DVGW W 336 for tapping valves with service shut-off,
- DVGW GW 335-B3, DVGW GW 335-B4 or ISO 17885 for material transition connectors,
- DIN EN ISO 11298-1 and -3 with reference to the EN 12201 series for close fit plastic piping systems.

in conjunction with DIN EN 12201-1 for the moulding compound³), DIN EN 12201-5 for the fitness for use of the system and FprCEN/TS 12201-7 for assessing conformity.

7.2 Hygienic requirements:

The materials that come into contact with drinking water must be hygienically safe and must not impair the quality of the drinking water as specified in the Drinking Water Ordinance. The products that come into contact with drinking water must have certificates of conformity in accordance with the recommendation of the Federal Environment Agency (UBA): "Recommendation for the confirmation of conformity of the drinking water hygiene suitability of products". If the products are manufactured from materials or substances that do not fall within the scope of the UBA's assessment basis, the materials must comply with the relevant standards and guidelines, insofar as these are applicable in the context of fulfilling the requirements of the Drinking Water Ordinance. If these technical standards or guidelines require tests as proof of suitability for drinking water hygiene, these must be verified by test reports from an accredited test laboratory.

³⁾ The conformity of the moulding compounds with the requirements of DIN EN 12201-1 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" (https://www.krv.de).

7.3 Requirements for the colouring of pipes

The RAL colours mentioned in the national preface of DIN EN 12201-2 according to 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.

Tubes	Stripes	Deductible Outer layer	Coexpressed Outer layer
PE 80: black RAL 9004	Light blue RAL 5012	-	-
PE 100, PE 100-RC: royal blue RAL 5005	-	-	-
PE 100, PE 100-RC: black RAL 9004	Royal blue RAL 5005	Royal blue RAL 5005	Royal blue RAL 5005

The following applies to export markets, provided there are no country-specific preferences: The pipes must be coloured black or blue. In addition, black pipes may be labelled with blue stripes according to national preference.

For pipes with a co-extruded or peelable outer layer, this outer layer must be coloured either black or blue. In addition, identification strips may be used depending on national preference.

7.4 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,
- Dimension 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 examination certificate is issued, an initial inspection of the manufacturing facility must be carried out. The inspector authorized by the certification body must be fully convinced that the manufacturer has the personnel and equipment required for the continuous proper manufacture and surveillance of the components. 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 (Evaluation Criteria of UBA) the audits on similar products at the manufacturer's plant, can be recognised.

The documentation for the tests mentioned in FprCEN/TS 12201-7, 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 Examinations

9.1 Type testing (type examination)

The scope of the component and system tests relevant for certification is specified by the conditions N, D, D1, $D2^{4}$, M, E:

- for the initial inspection / type examination (N)⁴) and for technical modifications and extensions,
- for the addition of one or more dimensions in a dimension group $(E)^{4}$,
- when changing the moulding compound (M)⁴,
- When changing the design / version (D, D1, D2)⁴),

The scope of testing is then determined for

- Pipes in FprCEN/TS 12201-7, Table 4,
- Fittings in FprCEN/TS 12201-7, Table 5⁵),
- Fittings in FprCEN/TS 12201-7, Table 6,
- Changes in the manufacturing process (P)⁴ according to FprCEN/TS 12201-7, Table 12, 13 and 14 (PVT),
- Tapping valves with service shut-off according to DVGW W 336,
- Material transition connector with PE-metal transition in accordance with DVGW GW 335-B4,
- Material transition connectors made of plastic (POM, PP) in accordance with DVGW GW 335-B3 and
- Material transition connector made of plastic (PE 100) in accordance with DVGW GW 335-B3-B1.
- For the initial certification of close fit pipework systems in accordance with ISO 11298-3, all test results in the column "ISO 11298-3" in Annex A2 must be submitted. In addition, Table 4 of FprCEN/TS 12201-7 applies if applicable to close fit pipework systems.

In the event of changes in the manufacturing process that go beyond the usual process-internal settings or adjustments or when changing the production site, the scope of the tests must be agreed individually between the certifier and the manufacturer depending on the effects.

⁴) Nomenclature according to tables 4 to 6 of prCEN/TS 12201-7

⁵⁾ For fittings used in gas and water supply, a gas/water type examination certificate can be issued using the product codes in Table 2, if the requirements of DIN EN 1555 according to "ZP 8111 Polyethylene piping systems according to DIN EN 1555 for gas supply" 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.

	Certification Programme	58141-00-N-GB		
DVGW	Polyethylene Piping Systems		ZP	
CERT	for the Water Supply	Author	DVGW CERT GmbH	
	ZP 8141	Status	11.04.2025	

The manufacturer shall commission a testing laboratory that fulfils 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 FprCEN/TS 12201-7, Tables 4, 5 and 6. As a rule, the manufacturer sends test samples to the testing laboratory commissioned to carry out the type test. Alternatively, samples can be taken by the testing laboratory in consultation with the manufacturer.

The testing laboratory carries out the tests in accordance with the "Certification body" column in Tables 4, 5 and 6 of FprCEN/TS 12201-7 and prepares a type test report for this purpose. Existing type test, supplementary test and control test reports in accordance with DVGW GW 335-A2⁶) for pipes or DVGW GW 335-B2⁶) for fittings can be recognised for type testing in accordance with DIN EN 12201 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 DVGW GW 335-A2 or -B2:

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

If reports on the type, supplementary or control test of an existing certification according to DVGW GW 335-A2 or B2 are considered for the type test according to DIN EN 12201, the interval until the next complete type test (15 years) is transferred to the certificate according to DIN EN 12201.

Supplementary tests for pipes certified in accordance with DVGW GW 335-A2 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 11298-3 is described in Annex A2. The supplementary tests for fittings certified in accordance with DVGW GW 335-B2 are listed in Annex B.

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).

The scope and frequency of self-surveillance tests are carried out for

- Tapping valves with service shut-off according to DVGW W 336,
- Material transition connector with PE-metal transition in accordance with DVGW GW 335-B4,
- Material transition connectors made of plastic (POM, PP) in accordance with DVGW GW 335-B3 and
- Material transition connector made of plastic (PE 100) in accordance with DVGW GW 335-B3-B1.



9.2.1 Batch release tests (BRT - release test)

The scope and frequency of the tests of components for the release test (BRT) are carried out for

- Pipes according to FprCEN/TS 12201-7, Table 8,
- Fittings according to FprCEN/TS 12201-7, Table 9,
- Fittings according to FprCEN/TS 12201-7, Table 10 and
- In addition to Table 8 of FprCEN/TS 12201-7, 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 11298-3 on 3 pipe sections with a minimum length of 50 mm per batch.

To determine the properties mentioned in Tables 7 to 10 of FprCEN/TS 12201-7, indirect tests may be carried out as part of the batch release test (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 FprCEN/TS 12201-7, Table 12,
- Fittings according to FprCEN/TS 12201-7, Table 13,
- Fittings according to FprCEN/TS 12201-7, Table 14 and
- Close fit pipes according to FprCEN/TS 12201-7, Table 12.

Type tests or audit tests from external surveillance that fall within the test interval of the process verification do not have to be repeated as a process verification.

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 FprCEN/TS 12201-7, Table 16,
- Fittings according to FprCEN/TS 12201-7, Table 17 and
- Fittings according to FprCEN/TS 12201-7, Table 18.
- In addition to Table 16 of FprCEN/TS 12201-7, 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 11298-3 for each 3 pipe sections with a minimum length of 50 mm:
 - annually on one diameter each of dimension group 2,
 - \circ annually on one diameter each of dimension group 3 and
 - per year on one diameter each of dimension group 4.
- Tapping valves with service shut-off according to DVGW W 336,
- Material transition connector with PE-metal transition in accordance with DVGW GW 335-B4 and



- Material transition connector made of plastic (POM, PP) in accordance with DVGW GW 335-B3
- Material transition connector made of plastic (PE 100) in accordance with DVGW GW 335-B3-B1.

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

The specifications described in the "Rules of procedure for the certification of products in the nonharmonised area" 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 Other 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 <58111> Zertifizierungsprogramm ZP 8111 "Rohrleitungssysteme aus Polyethylen nach DIN EN 1555 für die Gasversorgung"
- DVGW CERT GmbH <51000> Zertifizierungsprogramm ZP 1000 "Konformitätsbestätigung der trinkwasserhygienischen Eignung, Verfahren 1+"
- Empfehlung des Umweltbundesamt: Konformitätsbestätigung der trinkwasserhygienischen Eignung von Produkten. Stand: 29. Juli 2021
- KRV-Werkstofflisten A bis F der zertifizierten Werkstoffe für Druckrohre und -formstücke sowie der zertifizierten Streifenwerkstoffe für Druckrohre, <u>https://www.krv.de/artikel/gepruftegualitat-die-werkstoffliste-des-krv</u>, abgerufen am 18.03.2025
- 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-B3:2011-09 Kunststoff-Rohrleitungssysteme in der Gas- und Wasserverteilung - Teil B3: Mechanische Verbinder aus Kunststoffen (POM, PP) für die Wasserverteilung
- DVGW GW 335-B3-B1:2013-02
 1. Beiblatt für Verbinder aus PE 100 zu Kunststoff-Rohrleitungssysteme in der Gas- und Wasserverteilung - Teil B3: Mechanische Verbinder aus Kunststoffen (POM, PP) für die Wasserverteilung
- DVGW GW 335-B4:2014-04 Kunststoff-Rohrleitungssysteme in der Gas- und Wasserverteilung - Teil B4: Metallene Formstücke mit mechanischen oder Steckmuffenverbindungen für die Wasserverteilung - Anforderungen und Prüfungen



- DIN EN 12201- :2025-03 Kunststoff-Rohrleitungssysteme f
 ür die Wasserversorgung und f
 ür Entwässerungs- und Abwasserdruckleitungen - Polyethylen (PE)
 - Teil 1: Allgemeines
 - o Teil 2: Rohre
 - o Teil 3: Formstücke
 - o Teil 4: Armaturen
 - Teil 5:2021-05: Gebrauchstauglichkeit des Systems
- FprCEN/TS 12201-7:2024-05: Plastics piping systems for water supply, and for drains and sewers under pressure - Polyethylene (PE) - Part 7: Assessment of conformity.
- DIN EN ISO 11298-1:2018-07 Kunststoff-Rohrleitungssysteme f
 ür die Renovierung von erdverlegten Wasserversorgungsnetzen - Teil 1: Allgemeines
- DIN EN ISO 11298-3:2018-12 Kunststoff-Rohrleitungssysteme f
 ür die Renovierung von erdverlegten Wasserversorgungsnetzen - Teil 3: Close-Fit-Lining
- ISO 4427- :2019-08

Kunststoff-Rohrleitungssysteme für die Wasserversorgung und für Entwässerungs- und Abwasserdruckleitungen - Polyethylen (PE)

- o Teil 1: Allgemeines
- o Teil 2: Rohre
- o Teil 3: Formstücke
- Teil 5: Gebrauchstauglichkeit des Systems
- EN ISO/IEC 17025: 2018-03

Allgemeine Anforderungen an die Kompetenz von Prüf- und Kalibrierlaboratorien ISO/IEC 17025

12 Period of validity

This certification programme is valid from 11.04.2025 until further notice.

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

Comparison of type testing/type examination of PE pipes according to DVGW GW 335-A2, Table 7 and DVGW GW 335-A2-B1 vs. FprCEN/TS 12201-7, Table 4.

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

Standard		DV0	GW GW (A2 (-B1)	335- ^{a)}	FprCEN/TS 12201-7				
Examinations			EC 1	EC 2	EC 3	AG 1	AG 2	AG 3	AG 4+5
Requirements f	or the mate	erial	x (KRV listing required)		x 0 (Properties according to DIN EN 12201-1)				
Labelling			x	x	X		Х	(+ ^{b)}	
Texture / surfac	e finish		x	x	X	x =	x =	x =	X +
Colour			x	x	x	x =	x =	x =	X +
Dimensions			x	x	x	x =	x =	x =	X +
Hot storage DI	NEN ISO 2	2505	x	x	x	x =	x =	x = ^{c)}	- 0
Homogeneity IS	SO 18553		x	x	x	- 0	- 0	- 0	- 0
Creep rupture t (80 °C / 165 h)	est DIN EN IS	O 1167-1/-2	x ^{d)}	X ^{d)}	X ^{d)}	- 0	- 0	- 0	- 0
Creep rupture t (80 °C / 1,000 h	est n) DIN EN I	ISO 1167-1/-2	-	-	-	X +	X +	X +	X + ^{b)}
Creep rupture t (20 °C / 100 h)	est DIN EN IS	O 1167-1/-2	-	-	-	X +	X +	X +	X + ^{b)}
Melt flow rate (I	MFR) DIN	EN ISO 1133-1	x	x	x	X + ^{e)}	X + ^{e)}	X + ^{e)}	X + ^{e)}
Changing the d	iameter of	pipe ends	-	-	-	-	-	X +	X +
Elongation at break/elongation at break DIN EN ISO 6259-1/-3		x	x	x	x =	x =	x =	X +	
Delamination/la	iyer separa	ation	-	-	-	X +	X +	X +	X +
(only for coextr	DE 80 &								
	PE 100	DIN EN ISO 13479	-	-	-	X ¹⁾	X +	X +	X +
Popiotopop to		Solid wall pipes ^{h1)} (monolayer): SHT ISO 18488	-	-	-	X +	-	-	-
slow crack growth	100-RC	Coexpressed tubes ^{h2)} : SHT ISO 18488	-	-	-	x +	x +	x +	X +
	ЪЕ	ANPT DIN EN ISO 13479	-	-	-	-	x +	-	-
		CRB ISO 18489	-	-	-	-	-	x +	X +
Oxidation induction time (thermal Stability) DIN EN ISO 11357-6		-	-	-	X + ^{e)}	X + ^{e)}	X + ^{e)}	X + ^{e)}	
Weather resistance DIN EN ISO 16871			-	-	-		X	(+ ^{g)}	
Tensile strengt	n of butt-we	elded joints	-	-	-	-	X + ^{b)}	-	-
Structural integ coextruded pipe	rity after de es)	eformation (only for	-	-	-	X +	X +	X +	X +

EC Product group

AG Dimension group



Legend:

X	A requirement is specified in the standard.
-	No requirement is specified in the standard.
_	The requirements specified in both standards are identical.
=	No additional tests are required.
	There are differences between the two standards, but no additional tests are required
0	tests are required because, for example, no or fewer requirements are specified in
	FprCEN/TS 12201-7.
+	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) Proof of the raw material manufacturer, also applies to the protective coating
- h1) Also applies to solid-wall pipes (monolayer) with removable additional layer (protective jacket pipes)
- h2) Also applies to co-extruded pipes with removable additional layer (protective jacket pipes)

14 Annex A2 (informative): Supplementary tests for close fit pipes (DIN EN ISO 11298-3)

certified in accordance with DVGW GW 335-A2

Comparison of type testing/type examination of PE pipes (FG 2 and FG 3) based on DVGW GW 335-A2, Table 7 and DVGW GW 335-A2-B1 vs. close fit pipes according to DIN EN ISO 11298-3 and FprCEN/TS 12201-7, Table 4.

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

Standard			DVGW GW 335- A2 (-B1)		DIN EN ISO 11298-3		
Examinations			EC 2	EC 3	AG 2	AG 3, AG 4	Section
Requirements for the material			x (KRV listing required)		x (properties ac- cording to DIN EN 12201-1)		5.1 + 5.9 ^{j)}
Labelling				x	x -	+ ⁱ⁾	5.8 + 5.9 ^{j)}
Texture / surfa	ace finish		:	x		⊢ ^{k)}	5.2.1 + 5.9 ^{j)} 8.2 + 8.9 ^{o)}
Colour			:	x	x	0	5.2.2 + 5.9 ^{j)}
Dimensions				x	х -	F ^{k)}	5.4 + 5.9 ^{j)} 8.4 + 8.9 ^{o)}
Hot storage / according to D	ongitudina	al shrinkage O 2505		x	x -	⊢ ^{L)}	5.6 + 5.9 ^{j)}
Creep rupture (80 °C / 165 h	test) DIN EN	ISO 1167-1/-2		x	X + '	n or n)	5.5 + 5.9 ^{j)}
Creep rupture (80 °C / 1,000	test h) DIN El	N ISO 1167-1/-2		-	X + ⁿ⁾		8.5 + 8.9 ^{o)}
Creep rupture (20 °C / 100 h	test) DIN EN	ISO 1167-1/-2	-		X + ⁿ⁾		8.5 + 8.9 ^{o)}
Melt flow rate	(MFR) DI	N EN ISO 1133-1	x ^{p)}		X + ^{L), p)}		5.3 + 5.9 ^{j)}
Elongation at DIN EN ISO 6	break/elor 259-1/-3	ngation at break	x		X + ⁿ⁾		8.5 + 8.9 °)
Delamination/ (only for coext	layer sepa truded pip	aration es)	-		X + ^{q)}		(DIN EN 12201-2, Annex A.7)
````	PE 80, PE 100	NPT DIN EN ISO 13479	-		<b>X +</b> ^{n), r)}		(FprEN12201-7 Table 4)
Desistance		Solid wall pipes ^{s1)} (monolayer): SHT ISO 18488	-	-	-	-	(FprEN12201-7 Table 4 for AG 1)
to slow crack	υ Ω	Coexpressed pipes ^{s2)} : SHT ISO 18488	-	-	X +	X +	(FprEN12201-7 Table 4 for AG 1)
growin	100-F	ANPT DIN EN ISO 13479	-	-	<b>X +</b> n), r)	-	(FprEN12201-7 Table 4)
	Ш	CRB ISO 18489	-	-	-	<b>X +</b> ⁿ⁾	(FprEN12201-7 Table 4)
Oxidation induction time (thermal Stability) DIN EN ISO 11357-6		<b>x</b> ^{p)}		<b>X +</b> ^{L), p)}		5.3 + 5.9 ^{j)}	
Weather resistance DIN EN ISO 16871			-		<b>X</b> + ^{t)}		(DIN EN 12201- 1, 5.2.3.2)
Tensile strength of butt-welded joints			-		X + ^{u)}		ISO 4437-5, 4 or DIN EN 12201- 5, 5.2.2.1



Standard	DVGW GW 335- A2 (-B1)	DIN EN ISO 11298-3	
Structural integrity after deformation (only for coextruded pipes)	-	X +	(DIN EN 12201- 2, Annex A.8)
Resilience (memory effect)	-	<b>X +</b> ^{L)}	5.6 + Annex A

EC Product group

AG Dimension group

#### Legend:

X	A requirement is specified in the standard.
-	No requirement is specified in the standard.
_	The requirements specified in both standards are identical.
-	No additional tests are required.
	There are differences between the two standards, but no additional tests are required
0	tests are required because, for example, no or lower requirements are specified in DIN
	EN ISO 11298-3.
+	There are differences between the two standards that require additional testing.

Further information on tests is specified in the following footnotes.

#### Footnotes:

- i) Checking the manufacturer's results
- j) According to DIN EN ISO 11298-3, section 5.9, the parts of ISO 4427 (e.g. ISO 4427-1, ISO 4427-2 and ISO 4427-5) specified as normative references in sections 5.1 to 5.8 are to be replaced by the corresponding parts of EN 12201 (EN 12201-1, EN 12201-2 and EN 12201-5) 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)
- According to DIN EN ISO 11298-3, section 8.9, the parts of ISO 4427 (e.g. ISO 4427-2 and ISO 4427-5) specified as normative references in sections 8.1 and 8.5 are to be replaced by the corresponding parts of EN 12201 (EN 12201-2 and EN 12201-5) in countries of the European Single Market
- p) per shift
- q) Examination 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-state⁷)
- s1) Also applies to solid-wall pipes (monolayer) with removable additional layer (protective jacket pipes)
- s2) Also applies to co-extruded pipes with removable additional layer (protective jacket pipes)
- t) Proof of the raw material manufacturer, also applies to the protective coating
- u) Checking the manufacturer's results on a diameter

⁷) R. Glanert, J. Grieser: Trenchless close-fit installations in PE 100-RC quality, 3R international - Issue 06, 2014, page 24-26

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

Comparison of type testing/type examination of moulded parts according to DVGW GW 335-B2, Table 6 and DVGW GW 335-B2-B1 vs. FprCEN/TS 12201-7, Table 5.

For certification in accordance with this ZP, the scope of testing in accordance with FprCEN/TS 12201-7 must be demonstrated.

Standard	DVGW GW 335-B2 (-B1) ^{v)}	FprCEN/TS 12201-7		
Examinations			Scope of testing	
General information	Х	Х	AG 1, AG 2, AG 3: 5 fittings of	
Characteristics	х	Х	one diameter per dimension	
Surface finish	х	х	group and fitting group,	
Electrical properties	х	Х	AG 4 and AG 5: 1 fitting of one	
Colour	х	Х	diameter per dimension group	
Dimensions	х	Х	and fitting group.	
Melt index	х	х	1 Sample / group of moulded parts	
OIT	-	х	1 moulded piece / group of moulded pieces	
Hygiene	х	National require- ments	Testing: UBA-BWGLs, certifica- tion: UBA recommendation for conformity assessment	
Pressure drop	х	No test	-	
Labelling	х	х	1 test specimen of a diameter / dimension group / moulding group / cavity	
Creep rupture test	80°C / 165 h	20°C / 100 h	AG 1, AG 2, AG 3: 3 fittings of one diameter per dimension group and fitting group, AG 3: 1 fitting of one diameter per dimension group and fitting	
	-	80°C /1000 h	AG 4 and AG 5: By checking the manufacturer's test results.	



Standard	DVGW GW 335-B2 (-B1) ^{v)}	FprCEN/TS 12201-7				
	PE 100 SDR 11 +23°C	PE 100 SDR maximum value +23°C, ISO 11413, Annex C, condition 1				
	No test	PE 100 SDR minimum value +23°C, ISO 11413 Annex C, condition 1				
Peel resistance ISO 13954 or 13955 for sockets, ISO 13956 for	PE 100 SDR 11 -10°C	PE 100 SDR minimum value, Tmin, ISO 11413 Annex C, condition 2	AG 1, AG 2, AG 3: One fitting of one diameter per dimension group, fitting type and condition, AG 4 and AG 5: By checking the			
saddle	PE 100 SDR 17 -10°C	PE 100 SDR minimum value, Tmax, ISO 11413 Annex C, condition 3	manufacturer's test results.			
	PE 80 SDR 17.6 +45°C	PE 80 on customer request				
	PE 100 SDR 11, +23°C angulation	No test				
	No test	PE 100 with PE 100 +23°C, ISO 14114, Annex B, Condition 1	By checking the manufacturer's			
Tensile strength of butt-welded joints	No test	PE 100 with PE 100 -5°C, ISO 14114, Annex B Bed. 2	able, then: 1 moulding per di- mension group, moulding group			
	No test	PE 100 with PE 100 +40°C, ISO 14114, Annex B Bed. 3				
Impact stress	x	(for water tapping fittings)	AG 1 to 3: 1 moulded piece per dimension group, AG 4 and 5: No audit			
Creep rupture ten- sile test	x	No test	-			
Moulded parts made of PE 100-RC:	No test	Strain hardening test SHT (regrind from moulded parts)	1 moulding from the "Product range"			



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Standard	DVGW GW 335-B2 (-B1) ^{v)}	FprO	CEN/TS 12201-7
Resistance to slow crack growth			

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