



ZG 200-1

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Technical specification of OFI CERT for

Flexible pre-insulated pipe systems for district heating networks with bonded plastic service pipes

General requirements and tests
for the label OFI CERT

Allgemeine Anforderungen und Prüfungen
für die Zuerkennung des Zeichens OFI CERT

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This technical specification is constantly reviewed by OFI CERT and its' stakeholders.
Written remarks and improvements are appreciated.

Content	Page
1 Scope	2
2 Abbreviations	2
3 Classification	2
4 Requirements for Service Pipe Systems	2
4.1 General Requirements	2
4.2 Oxygen Tightness	2
4.3 Marking	2
4.4 Packaging	3
5 Assessment of Conformity	3
5.1 General	3
5.2 Requirements to the Manufacturer of the Service Pipes and the Flexible Pre-insulated District Heating System	3
5.3 Type Test	3
5.4 Batch Release Test	3
5.5 Process Verification Test	4
5.6 Audit Test	4
6 Referenced Standards	4

1 Scope

This technical specification covers flexible pre-insulated pipe systems for district heating networks with bonded plastic service pipes with a maximum operating temperature up to 95 °C, a maximum operating pressure up to 10 bar and a minimum service life-time of 30 years. The flexible pre-insulated pipe systems covered by this technical specification consists of:

- Service pipes out of PE-X, PB or multilayer-pipes (ML-P and ML-M both consisting out of PE-X), with or without a barrier layer;
- Insulation layer out of PUR;
- Outer casing out of PE;

2 Abbreviations

AT	Audit Test
BRT	Batch Release Test
DN	Nominal diameter of the service pipe
ML-M	Multi layer pipe consisting of polymer and metallic layers
ML-P	Multi layer pipe consisting of polymer layers only
PE	Polyethylene
PE-X	Cross-linked polyethylene
PB	Polybutylene
PUR	Polyurethane
PVT	Process Verification Test
TT	Type Test

3 Classification

The classification of the pipe system in terms of operating temperatures, maximum operating pressures and service life shall be in accordance with section 4 of EN 15632-2:2010+A1:2014.

4 Requirements for Service Pipe Systems

4.1 General Requirements

Service pipes and fittings shall comply with:

- EN ISO 15875-1, -2, -3 and -5;
- EN ISO 15876-1, -2, -3 and -5;
- EN ISO 21003-1, -2, -3 and -5;

In case of PE-X service pipes the degree of cross linking given in EN ISO 15875-2 must be reached before the insulation and casing.

4.2 Oxygen Tightness

The oxygen diffusion of the barrier layer shall be tested on a service pipe in DN 20 or DN 25 according to ISO 17455. At a testing temperature of 80 °C the oxygen diffusion shall be maximum 1.80 mg/(m²d).

4.3 Marking

The marking is made on the surface of the service pipe and the casing every meter by means of color printing or another method providing pipe integrity and not decreasing pipe quality. The marking shall at least contain:

- Manufacturer name and/or trade name;
- Dimension;

- Maximum operating temperature;
- Maximum operating pressure;
- Production date, batch and production line (coded or uncoded);

After certification the manufacturer may use the sign OFI CERT together with the number of the this technical specification (ZG 200-1) on the service pipes and the casing.

4.4 Packaging

Pipes in coils or on drums shall be fixed in not less than four positions. Pipe ends shall be protected against the ingress of dirt and water by the use of endcaps.

5 Assessment of Conformity

5.1 General

The assessment of conformity is done by TT, BRT, PVT and AT. Additionally the requirements in section 5.2 apply to the manufacturer.

5.2 Requirements to the Manufacturer of the Service Pipes and the Flexible Pre-insulated District Heating System

- a) The manufacturer(s) shall produce the product in such a way, that a constant high quality level is ensured. Therefore the technical equipment in the production shall be the state of the art. Qualified staff and the testing equipment needed for the assessment of conformity shall be available. The testing equipment shall be calibrated at least once a year, to ensure the correctness of the test results.
- b) The quality management system shall be certified according to ISO 9001.

5.3 Type Test

5.3.1 General

The TT is performed by an accredited inspection and testing body before the certification is established and consists of an initial inspection of the production site and tests on samples, that are taken from there. The inspection shall also confirm the requirements in 5.2.

Between the manufacturer and the inspection and testing body as well as the certification body a certification contract needs to be established.

5.3.2 Type Test of the Service Pipe System

The TT on service pipe system is performed according to the relevant CEN ISO/TS 15875-7, CEN ISO/TS 15876-7 or CEN ISO/TS 21003-7. In addition the test in 4.2 and 4.3 is executed.

5.3.3 Type Test of the Flexible Pre-insulated District Heating System

The TT is performed on one dimension according to Annex D of EN 15632-1:2009+A1:2014 and sections 5.3, 5.4 and 5.5 of EN 15632-2:2010+A1:2014.

5.4 Batch Release Test

5.4.1 General

Products are accepted and released in batches. The batch is considered as the clearly identifiable cut of pipe of the same type, manufactured on the same production line under the same steady state conditions. The batch size shall not exceed 2 000 m.

If the result of at least one characteristic is not satisfactory, a re-test is conducted on double quantity of samples. If results of re-testing are also not satisfactory, then the batch or a segment of batch is rejected.

5.4.2 Batch Release Test of the Service Pipe

The BRT on service pipe is performed according to the relevant CEN ISO/TS 15875-7, CEN ISO/TS 15876-7 or CEN ISO/TS 21003-7.

5.4.3 Batch Release Test of the Flexible Pre-insulated District Heating System

The BRT on flexible pre-insulated district heating system is specified by the manufacturer in his quality plan.

5.5 Process Verification Test

5.5.1 General

The stability of the production process in a long-term run is verified in a PVT. If the result of at least one characteristic is not satisfactory, a re-test is conducted on double quantity of samples. If results of re-testing are also not satisfactory, then the batch or a segment of batch is rejected.

5.5.2 Process Verification Test of the Service Pipe

The PVT on service pipes is performed according to the relevant CEN ISO/TS 15875-7, CEN ISO/TS 15876-7 or CEN ISO/TS 21003-7.

5.5.3 Process Verification Test of the Flexible Pre-insulated District Heating System

The PVT on flexible pre-insulated district heating systems is specified by the manufacturer in his quality plan.

5.6 Audit Test

5.6.1 General

Regularly based on the certification contract (5.3.1) the AT is performed by an accredited inspection and testing body. The AT consists of an inspection of the production site, the control of the performed BRT and PVT as well as tests on samples, that are taken from the production site. The inspection shall also confirm the requirements in 5.2.

5.6.2 Audit Test of the Service Pipe

The AT on service pipes is performed according to the relevant CEN ISO/TS 15875-7, CEN ISO/TS 15876-7 or CEN ISO/TS 21003-7 once a year.

5.6.3 Audit Test of the Flexible Pre-insulated District Heating System

The AT on flexible pre-insulated district heating systems is performed on one dimension every 3 years according to Annex D of EN 15632-1:2009+A1:2014 and sections 5.3, 5.4 and 5.5 of EN 15632-2:2010+A1:2014.

6 Referenced Standards

EN 15632-1	District heating pipes - Pre-insulated flexible pipe systems - Part 1: Classification, general requirements and test methods
EN 15632-2	District heating pipes - Pre-insulated flexible pipe systems - Part 2: Bonded plastic service pipes - Requirements and test methods
EN ISO 15875-1	Plastics piping systems for hot and cold water installations - Cross-linked polyethylene (PE-X) - Part 1: General
EN ISO 15875-2	Plastics piping systems for hot and cold water installations - Cross-linked polyethylene (PE-X) - Part 2: Pipes
EN ISO 15875-3	Plastics piping systems for hot and cold water installations - Cross-linked polyethylene (PE-X) - Part 3: Fittings
EN ISO 15875-5	Plastics piping systems for hot and cold water installations - Cross-linked polyethylene (PE-X) - Part 5: Fitness for purpose of the system
EN ISO 15876-1	Plastics piping systems for hot and cold water installations - Polybutylene (PB) - Part 1: General
EN ISO 15876-2	Plastics piping systems for hot and cold water installations - Polybutylene (PB) - Part 2: Pipes
EN ISO 15876-3	Plastics piping systems for hot and cold water installations - Polybutylene (PB) - Part 3: Fittings
EN ISO 15876-5	Plastics piping systems for hot and cold water installations - Polybutylene (PB) - Part 5: Fitness for purpose of the system
EN ISO 21003-1	Multilayer piping systems for hot and cold water installations inside buildings - Part 1: General

EN ISO 21003-2	Multilayer piping systems for hot and cold water installations inside buildings - Part 2: Pipes
EN ISO 21003-3	Multilayer piping systems for hot and cold water installations inside buildings - Part 3: Fittings
EN ISO 21003-5	Multilayer piping systems for hot and cold water installations inside buildings - Part 5: Fitness for purpose of the system
ISO 9001	Quality management systems - Requirements
ISO 17455	Plastics piping systems - Multilayer pipes - Determination of the oxygen permeability of the barrier pipe
CEN ISO/TS 15875-7	Plastics piping systems for hot and cold water installations - Cross-linked polyethylene (PE-X) - Part 7: Guidance for the assessment of conformity
CEN ISO/TS 15876-7	Plastics piping systems for hot and cold water installations - Polybutylene (PB) - Part 7: Guidance for the assessment of conformity
CEN ISO/TS 21003-7	Multilayer piping systems for hot and cold water installations inside buildings - Part 7: Guidance for the assessment of conformity