

DIN EN 448:2025-07 (E)

District heating pipes - Bonded single pipe systems for directly buried hot water networks - Factory made fitting assemblies of steel service pipes, polyurethane thermal insulation and a casing of polyethylene

| Contents | | Page |
|-------------------------|---|-------------|
| European foreword | | 4 |
| Introduction | | 5 |
| 1 | Scope | 6 |
| 2 | Normative references | 6 |
| 3 | Terms and definitions | 8 |
| 4 | Requirements | 8 |
| 4.1 | Steel parts | 8 |
| 4.1.1 | Specification | 8 |
| 4.1.2 | Wall thickness and diameter | 9 |
| 4.1.3 | Bends | 9 |
| 4.1.4 | T-pieces | 10 |
| 4.1.5 | Reducers | 10 |
| 4.1.6 | Welding of steel parts | 10 |
| 4.1.7 | Surface condition | 15 |
| 4.2 | Casing | 15 |
| 4.3 | Polyurethane foam thermal insulation | 15 |
| 4.4 | Fitting assembly | 15 |
| 4.4.1 | General | 15 |
| 4.4.2 | Thermal insulation series | 15 |
| 4.4.3 | Fitting ends | 15 |
| 4.4.4 | Angle between casing segments of bend and minimum length | 16 |
| 4.4.5 | Polyethylene welding | 16 |
| 4.4.6 | Diameter and wall thickness of the casing | 17 |
| 4.4.7 | Minimum thickness of the thermal insulation in fitting assembly | 18 |
| 4.4.8 | Tolerances of the main fitting dimensions | 18 |
| 4.4.9 | Expected thermal life and long term temperature resistance | 18 |
| 4.4.10 | Thermal conductivity | 18 |
| 4.4.11 | Surface conditions at delivery | 19 |
| 4.4.12 | Measuring wires for surveillance system | 19 |
| 5 | Test methods | 19 |
| 5.1 | General | 19 |
| 5.2 | Test specimens | 19 |
| 5.3 | Steel parts | 19 |
| 5.3.1 | Leak-tightness test with water | 19 |
| 5.3.2 | Visual leak-tightness test by air with over pressure | 20 |
| 5.3.3 | Visual leak-tightness test by air with below atmospheric pressure | 20 |
| 5.4 | Casing | 20 |
| 5.4.1 | Visual testing of weld seams on casing | 20 |
| 5.4.2 | Bending test of weld seams on casing | 23 |
| 5.5 | Fitting assembly | 24 |
| 5.5.1 | Centre line deviation and angular deviation | 24 |
| 5.5.2 | Minimum thickness of the polyurethane foam thermal insulation | 24 |
| 5.5.3 | Thermal conductivity in unaged condition | 24 |

| | | |
|--|---------------------------------|-----------|
| 6 | Marking | 24 |
| 6.1 | General | 24 |
| 6.2 | Steel service pipe | 25 |
| 6.3 | Steel fittings | 25 |
| 6.4 | Casing | 25 |
| 6.5 | Fitting assembly | 25 |
| Annex A (informative) Guidelines for inspection and testing | | 26 |
| Annex B (informative) Procedures for casing welding | | 29 |
| Annex C (informative) Waste treatment and recycling | | 32 |
| Bibliography | | 33 |