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Prefabricated directly buried insulating pipes and fittings with polyurethane [PUR] foamed-plastics and high density polyethylene [PE] casing pipes

高密度聚乙烯外护管硬质聚氨酯泡沫塑料预制直埋保温管及管件

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Foreword

This standard is drafted out according to the rules in GB/T1.1-2009.

This standard is put forward by the Ministry of Housing and Urban-Rural Development of the People's Republic of China.

The standard is taken charge of by the nationwide urban heating standardization technical committee (SAC/TC 455).

It is drafted by: Beijing HTN Pipeline Equipment Co., Ltd, China Urban Construction Design & Research Institute, the Fourth Detection Office of Beijing Construction Engineering Quality Center, Tianjin Pipeline Engineering Group CO., LTD. Insulating Factory, Hebei Haotian Thermoelectric Device Co., Ltd., Dalian Yiduo Piping Co.,Ltd, Tianjin Yugang Heat Preservation Construction Material Co., Ltd., Tangshan Xingbang Pipe Construction Equipment Co., Ltd, Dalian Kaiyuan Pipeline Co., Ltd.

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Introduction

Base on the nationwide conditions of our national heating industry, this standard is made on reference to the EN 253 *Regional Heating Hot Water Pipeline Network - Prevaricated Directly Buried Insulating Pipe Constituted by Working Steel Pipe, Polyurethane Insulation Coating and High Density Polyethylene External Protecting Tube*, EN 448 *Regional Heating Hot Water Pipeline Network - Prevaricated Directly Buried Insulating Fittings Constituted by Working Steel Pipe, Polyurethane Insulation Coating and High Density Polyethylene External Protecting Tube* and EN489 *Regional Heating Hot Water Pipeline Network - Prevaricated Directly Buried Insulating Pipeline Joints Constituted by Working Steel Pipe, Polyurethane Insulation Coating and High Density Polyethylene External Protecting Tube* 2003 and 2009.

This standard is composed of directly buried insulating pipe, fittings and joints, putting forward more specific and clear regulations on the relative performance of directly buried insulating pipes and weak insulating fittings and joints in the process of production and site construction.

Prefabricated Directly Buried Insulating Pipes and Fittings With Polyurethane Foamed-Plastics And High Density Polyethylene Casing Pipes

1. Scope

This standard has made a clear requirement on the structure, requirement, testing method, inspection rules and markings, transportation and storage, etc. of prefabricated directly buried insulating pipes (hereafter referred to as insulating pipe) and insulating fittings and insulating joints products constituted by high density Polyethylene external protecting tube (hereafter referred to as external protecting tube), rigid polyurethane foam anticorrosion insulation layer (hereafter referred to as insulating layer), working steel pipe and steel fittings.

It applies to the manufacturing and inspection of prefabricated directly buried insulating pipe, insulating fittings and insulating joints with a transmission medium temperature (regular operating temperature) of 120℃ at most and a maximum 140℃ random peak temperature.

2. Normative references

The following files are essential to the application of this document. References and quotations with dates applied to this document are of those dates only. For references and quotations without indicated dates, the latest versions (including all amendments) shall apply.

GB/T 8163	Seamless Steel Tubes For Liquid Service
GB/T 8923.1	Rust Grades and Preparation Grades of Steel Surfaces before Application of Paints and Related Products
GB/T 9711	Pipeline for Oil and Gas Industry and Pipeline Transmission System
GB/T 12459	Steel Butt-welding Seamless Pipe Fittings
GB/T 13401	Steel Plate Butt-welded Fittings
GB/T 18475-2001	Classification and Designation of Thermoplastics Materials of

	Pipes and Fittings for Pressure Applications --Overall Service (Design) Coefficient
GB/T 29046-2012	Test Methods of Technical Specification For Pre-Insulated Directly Buried District Heating Pipes
GB 50236-2011	Code for Construction of Field Equipment, Industrial Pipe Welding Engineering
CJJ 28	Code for Construction and Acceptance of City Heating Pipelines
CJJ/T 81	Technical Specification for Directly Buried Heating Pipeline in City
JB 4708	Welding Procedure Qualification for Pressure Equipment
JB/T 4730	Non-destructive Testing of Pressure Equipment
SY/T 5257	Steel Bend for Oil and Gas Transmission
TSG Z6002	Examination Rules for Welding Operators of Special Equipment
API SPEC 5L	Specification for Line Pipe

3. Terms and Definitions

For the purpose of this standard, the following terms and definitions shall apply.

3.1 Bonded insulation structure

Working steel pipes or steel fittings are bonded to external protecting tube closely by insulating layer, forming into an integrated insulating pipe or insulating fitting structure.

3.2 Steel fitting

Pipe fitting components include reducing pipe, tee joint, bend, elbow and fixed knots.

3.3 Bend angle

It is the central angle corresponding to the bend or elbow arc.

3.4 Heat-extruded bend

It is prefabricated by mandrel pusher with heated seamless steel pipeline section.

3.5 Forge-welded bend

The bend is vertically welded after the steel plate is forged into shape.

3.6 Forge-welded elbow

It is vertically welded into shape with forged steel plate whose radius is over or equal to 2.5 times of nominal diameter.

3.7 Hot bend

It is bent into shape by hot steel pipe and the bent radius is over or equal to 2.5 times of nominal diameter.

3.8 Welded Tee-branch

It is welded directly on the main pipe hole with steel pipe branch.

3.9 Extruded T-Branch

It is made under normal temperature by giving hydraulic pressure to the pipeline inner part and drawing out branch tube round hole.

3.10 Joint with sleeve

It is joint structure type made by high density Polyethylene external protecting layer, FJRD and insulating layer.

3.11 Electric fusion welding joint

It is joint structure type made by electric fusion welding band sleeve and insulating layer. The sleeve is constituted by high density Polyethylene external protecting layer and electric thermal fuse embedded.

3.12 Tensile and shear strength of weld area in electric fusion weld joint

Tensile strength and shear resistance of the external protecting pipe electric welding joint region under the force of stretching, shearing and peeling.

3.13 Peeling strength

It is the force needed of foundation material surface peeling by anti corrosion layer of unit width.

3.14 Calculated continuous operating temperature (CCOT)

By assuming an Arrhenius relation between temperature and working life, the continuous operating temperature of ensuring a 30 years expecting life is calculated.

3.15 Thermal life

It refers to the time of shearing strength reduced to 0.13 MPa (140℃) when insulating pipe operates continuously under selected old testing temperature in the process of CCOT test.

3.16 Creep behavior

It refers to the resistance of external protecting tube and polyurethane foaming plastic gradually and slowly made under the effects of temperature and stress.

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