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مدیریت پژوهش و فناوری

امور تدوین استانداردها

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مشخصات فنی خرید

گازرسانی پلی اتیلن : لوله های پلی اتیلن

P.E. Gas Piping : part(1) P.E. Pipes



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دفتر مدیر عامل



## ابلاغ مصوبه هیأت مدیره



مدیر محترم پژوهش و فناوری

باسلام،

به استحضار می‌رساند در جلسه ۱۶۵۷ مورخ ۱۳۹۴/۸/۲۴ هیأت مدیره، نامه شماره گ. ۱۱۹۷۱۹/۰۰۰/۹ مورخ ۹۴/۸/۱۸ مدیر پژوهش و فناوری تحت عنوان تصویب نهایی استاندارد "مشخصات فنی خرید لوله های پلی اتیلن" مطرح و با پیشنهاد تصویب استاندارد مشخصات فنی خرید لوله های پلی اتیلن (3) IGS-M-PL-014-1 موافقت بعمل آمد.

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## FOREWORD

This standard is intended to be mainly used by NIGC and contractors, and has been prepared based on interpretation of recognized standards, technical documents, knowledge, backgrounds and experiences in natural gas industry at national and international levels.

Iranian Gas Standards (IGS) are prepared, reviewed and amended by technical standard committees within NIGC Standardization division and submitted to the NIGC's "STANDARDS COUNCIL" for approval.

IGS Standards are subject to revision, amendment or withdrawal, if required. Thus the latest edition of IGS shall be checked/inquired by NIGC employees and contractors.

This standard must not be modified or altered by NIGC employees or its contractors. Any deviation from normative references and / or well-known manufacturer's specifications must be reported to Standardization division.

The technical standard committee welcomes comments and feedbacks about this standard, and may revise this document accordingly based on the received feedbacks.

## **GENERAL DEFINITIONS:**

Throughout this standard the following definitions, where applicable, should be followed:

- 1- "STANDARDIZATION DIV." is organized to deal with all aspects of industry standards in NIGC. Therefore, all enquiries for clarification or amendments are requested to be directed to mentioned division.
- 2- "COMPANY": refers to National Iranian Gas Company (NIGC).
- 3- "SUPPLIER": refers to a firm who will supply the service, equipment or material to NIGC whether as the prime producer or manufacturer or a trading firm.
- 4- "SHALL ": is used where a provision is mandatory.
- 5- "SHOULD": is used where a provision is advised only.
- 6- "MAY": is used where a provision is completely discretionary.

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## 1. Scope

This standard specification cancels and replaces IGS-MP-014-1(2) and provides NIGC'S requirements for material, manufacturing, testing, inspection, dimension, tolerances, marking, and etc, for polyethylene pipes in accordance with CEN specification EN 1555– 2: 2010 edition and ISO 4437: 2014 edition for PE 80,SDR 11 or PE 100, (SDR 11& SDR 13.6) at maximum operating pressure of 4bar.

For packing, handling, storage, transportation refer to IGS-C-DN-006.

This standard covers two types of pipe:

PE pipes (outside diameter dn) including four yellow identification stripes

PE pipes (outside diameter dn) with a peelable, thermoplastics PP material additional layer on the outside of the pipe ('coated pipe') as specified in Annex A.

## 2. References

Through out this standard specification the following standards and codes are referred to, the edition of these standards and codes that are in effect at the time of issues of this standard specification.

The applicability of changes in standards and codes that occur after the date of standards that referred shall be mutually agreed upon by the purchaser and supplier / or manufacturer.

### 2.1. Normative References:

|                      |                                                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BS 6730: 1986,       | <i>Black polyethylene up to nominal size 63 for above ground use for cold portable water.</i>                                                                     |
| EN 1056 :1996,       | <i>Plastics piping and ducting systems – plastics pipes and fittings – method for exposure to direct (natural ) weathering .</i>                                  |
| EN 1555-1: 2010,     | <i>Plastics piping systems for the supply of gaseous fuels– polyethylene (PE) – part 1: general .</i>                                                             |
| EN 1555-2:2010,      | <i>Plastic piping systems for the supply of gaseous fuels-Polyethylene (PE)-pipes.</i>                                                                            |
| EN 1555-5: 2010,     | <i>Plastics piping systems for the supply of gaseous fuels– polyethylene (PE) – part 5: fitness for purpose of the system.</i>                                    |
| EN ISO 1133:2005,    | <i>Plastics - determination of the melt mass – flow rate (MFR) and the melt volume – flow rate (MVR) of thermoplastics</i>                                        |
| EN ISO 3126 :1999,   | <i>Plastics piping systems – plastics piping components – measurement and determination of dimensions</i>                                                         |
| EN ISO 6259-1:1997,  | <i>Thermoplastic pipes-Determination of tensile properties-Part 1: General test method</i>                                                                        |
| EN ISO 6259-3 :1997, | <i>Thermoplastic pipes-Determination of tensile properties-Part 3: Polyolefin pipes</i>                                                                           |
| ISO 13477 : 2007,    | <i>Thermoplastics pipes for the conveyance of fluids – determination of resistance to rapid crack propagation (RCP) – small scale steady state test (S4 test)</i> |
| EN ISO 13478 : 2007, | <i>Thermoplastics pipes for the conveyance of fluids – determination of resistance to rapid crack propagation (RCP) –full scale test</i>                          |

|                        |                                                                                                                                                                                             |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EN ISO 13479: 2007,    | <i>Polyethylene pipes for the conveyance of fluids –determination of resistance to crack propagation – test method for slow crack growth on Notched pipes (notch test )</i>                 |
| EN ISO 2505 :2005,     | <i>Thermoplastics pipes – longitudinal reversion – test method and parameters</i>                                                                                                           |
| EN ISO 1167-1:2006,    | <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids – determination of fluids – determination of the resistance to internal pressure – part 1: general method</i> |
| EN ISO 1167-2: 2006,   | <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids – determination of the resistance to internal pressure part 2: preparation of pipe pieces</i>                 |
| GIS/PL2-2 : 2008,      | <i>Polyethylene pipes and fittings for natural gas and suitable manufactured gas Part 2 : pipes for use at pressures up to 5.5 bar</i>                                                      |
| ISO 1183               | <i>plastics – methods for determining the density and relative density of non-cellular plastic</i>                                                                                          |
| ISO 4437 : 2014,       | <i>Plastic piping systems for the supply of gaseous fuel – polyethylene (PE)-part 2</i>                                                                                                     |
| ISO FDIS 11357-6:2002, | <i>plastics – differential scanning calorimetry (DSC) – part 6: determination of oxidation induction time ( isothermal OIT ) and oxidation induction temperature (dynamic OIT)</i>          |
| ISO 13480 :1997,       | <i>Polyethylene pipes – resistance to slow crack growth – cone test method</i>                                                                                                              |

### 3. Definitions

#### 3.1. Batch Release Test (BRT)

Test performed by the manufacturer on a batch of material or components which has to be satisfactorily completed before the batch can be released.

#### 3.2. Lower predicted limit of the predicted hydrostatic strength $S_{LPL}$

Quantity with dimension of stress, which represents the 97.5% lower confidence limit of the predicted hydrostatic strength for a single value at a temperature T and a time t. It is denoted as:  $S_{LPL} = S(T, t, 0,975)$

#### 3.3. Minimum Required Strength (MRS)

Value of  $S_{LPL}$  at a temperature of 20°C and a time of 50 years( $S_{(20,50years,0,975)}$ ), rounded down to the next smaller value of the R10 series or of the R20 series conforming to ISO 3, ISO 497 and ISO 12162 , depending on the value of  $S_{LPL}$

#### 3.4. Melt mass Flow Rate ( MFR):

A value relating to the viscosity of the molten material at a specified temperature and rate of shear.

#### 3.5. Peelable Pipe

Pipe made with polyethylene core material over which is an outer skin, which is removed locally with the aid of simple tools, prior to fusion jointing