

ICS 75.180.10

CCS E 94



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 21412.5-2017

Replacing GB/T 21412.5-2010

**Petroleum and natural gas industries -- Design and operation of
subsea production systems -- Part 5: Subsea umbilical**

石油天然气工业 水下生产系统的设计和操作 第5部分：水下脐带缆

(English Translation)

Issued on: October 14, 2017

Implemented on: May 1, 2018

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China, Standardization
Administration of the People's Republic of China**

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Foreword

GB/T 21412 "Design and operation of oil and gas industry underwater production system" is divided into 15 parts.

- Part 1. General requirements and recommended practices;
- Part 2. Non-bonded flexible pipe systems for the seabed and the sea;
- Part 3. Out of the pipeline (TFL) system;
- Part 4. Underwater wellhead equipment and Christmas tree equipment;
- Part 5. Underwater umbilical;
- Part 6. Underwater production control system;
- Part 7. Completion/workover riser systems;
- Part 8. Underwater vehicle (ROV) interface for subsea production systems;
- Part 9. Remote operation tool (ROT) maintenance system;
- Part 10. Cohesive flexible pipe specifications;
- Part 11. Flexible pipe systems for the seabed and the sea;
- Part 12. Dynamic production of legislation;
- Part 13. Underwater production system remote operation tools and interfaces;
- Part 14. Underwater high integrity pressure protection system;
- Part 15. Underwater structures and manifold.

This section GB/T 21412 Part 5.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This section uses the translation method is equivalent to using ISO 13628-5:2009 "design and operation of oil and gas industry underwater production system Part 5. Underwater umbilicals. " the documents of our country that are consistent with the corresponding international documents that are normative references in this section are as follows.

--- GB/T 3956-2008 conductor of the cable (IEC 60228:2004, IDT)

--- GB/T 5563-2013 Rubber and plastics hoses and hose assemblies - Hydrostatic test method (ISO 1402:2009, IDT)

--- GB/T 7129-2001 Determination of volume expansion of rubber or plastic hoses (idtISO 6801.1983)

--- GB/T 9574-2001 rubber and plastic hose and hose assembly test pressure, burst pressure and design pressure Ratio (idtISO 7751.1991)

--- GB/T 18422-2013 Determination of breathability of rubber and plastics hoses and hose assemblies (ISO 4080:2009, IDT)

--- GB/T 21412.8-2010 Design and operation of subsea production systems for oil and gas industry - Part 8. Underwater production System's Underwater Robot (ROV) Interface (ISO 13628-8:2002, IDT) this part of the National Oil and Gas Standardization Technical Committee (SAC/TC355) proposed and managed.

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Introduction

The second edition of this part is based on the first edition of ISO 13628-5, the first edition of ISO 13628-5 is based on APISpec17E second edition and API RP 17I first edition. The first edition of ISO 13628-5 has been adopted by API as the third edition of APISpec17E. APISpec17E fourth edition will be with the second edition of this section to be consistent.

Users of this section should note that for specific applications may require different from the requirements of this section, or than the rules in this section Set the content deeper requirements. This section is not intended to prohibit suppliers to provide products or buyers to accept the products provided by suppliers, for specific Applications, especially in the case of technological innovation or development, alternative equipment or engineering alternative. When using alternative to do Act, the supplier should be different from this part of the logo and provide detailed instructions.

Oil and gas industry Underwater production system design and operation Part 5.
Underwater umbilicals

1 Scope

GB/T 21412 provisions of this part of the umbilical cord and related ancillary equipment design, material selection, manufacturing, design verification, test, safety Installation and operation requirements, and gives the recommended practices for the oil and gas industry. Ancillary equipment does not include the upper block hardware device, these hard Parts are those that are not permanently connected to the umbilical cord over the upper block suspension terminals.

This section applies to separate components, such as cables, optical fibers, thermoplastic hoses or metal pipes constitute the umbilical cord, or combination of their navel with cable.

This section applies to static or dynamic operation of the umbilical, the path can be water - water, water - underwater and underwater -.

This section does not apply to the relevant components joints, unless these joints affect the umbilical or its ancillary equipment performance.

This section only applies to the following dimensions of the metal pipe wall thickness $t \geq 2$ Normative references the following documents for the application of this document is essential. For dated references, only the dated version applies to this article Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 5564-2006 rubber and plastic hose low temperature deflection test (ISO 4672:1997, IDT) GB/T 5568-2013 Rubber or plastic hose and hose assemblies Flexural hydraulic pulse test (ISO 6803:2008, IDT) ISO 527 (all parts) Determination of plastic tensile properties (Plastics-Determination of tensile properties) ISO 1402 Rubber, plastic hoses and hose assemblies Hydraulic static test (Rubber and plastic hoses and hose assemblies-Hydrostatic testing) ISO 4080 Rubber, plastic hoses and their combinations Determination of breathability (Rubber and plastic hoses and hose assemblies-Determination of permeability to gas) ISO 4406 Liquid Transmission Fluid Solid Particle Pollution Level Code-name method (Hydraulic fluid power-Fluids-Method for coding the level of contamination by solid particles) ISO 6801 Determination of rubber or plastic hose volume expansion (Rubber or plastic hoses-Determination of volumetric expansion) ISO 7751 Rubber, plastic hoses and hose assemblies Test pressure, ratio of burst pressure to design working pressure (Rubber and plastic hoses and hose assemblies-Ratios of proof and burst pressure to design working pressure) ISO 13628-8 Design and operation of subsea production systems for the oil and gas industry - Part 8. Underwater machines for subsea production systems (ROV) interface (Petroleum and natural gas industries-Design and operation of subsea production systems-Part 8: Remotely Operated Vehicle (ROV) interfaces on subsea production systems) ISO 8308 Rubber and plastics hoses and non-reinforced hoses - Determination of liquid wall penetration (Rubber and plastic hoses and tub-