



IRANIAN PETROLEUM STANDARD

IPS

MATERIAL AND EQUIPMENT STANDARD

FOR

SPECIAL PURPOSE COUPLINGS

FIRST EDITION

DECEMBER 2003

**DEPUTY MINISTER
FOR
ENGINEERING & TECHNOLOGY
RESEARCH AND STANDARDS**

FOREWORD

This Standard is intended to be used within and for Iranian Ministry of Petroleum (N.I.O.C, N.I.G.C, N.P.C., N.I.O.R.D.C. and other affiliate organizations and companies) and has been prepared on the basis of the recognized standards, scientific publications, technical documents, accumulated knowledge and experiences in petroleum industries at national and international levels.

Iranian Petroleum Standards are prepared by Iranian Petroleum Standards Organization reviewed and amended by the relevant technical standard committees to incorporate acceptable comments made by oil, gas and petrochemical experts.

Standards are finally approved by the "Standards High Council" of Iranian Ministry of Petroleum.

Iranian Petroleum Standards (IPS) are subject to amendment withdrawal, if required, thus the latest edition of IPS shall be applicable.

Any comment or recommendation submitted to the "Iranian Petroleum Standards Organization" will be evaluated in the relevant technical committee and will be considered in the next revision, upon approval.

GENERAL DEFINITIONS:

Throughout this Standard the following definitions shall apply.

"COMPANY" : Refers to one of the related and/or affiliated companies of the Iranian Ministry of Petroleum such as National Iranian Oil Company, National Iranian Gas Company, National Petrochemical Company etc.

"PURCHASER" : Means the "Company" Where this standard is part of direct purchaser order by the "Company", and the "Contractor" where this Standard is a part of contract documents.

"VENDOR" and **"SUPPLIER"** : Refers to firm or person who will supply and/or fabricate the equipment or material.

"WILL" : Is normally used in connection with the action by the "Company" rather than by a contractor, supplier or vendor.

"MAY" : Is used where a provision is completely discretionary.

"SHOULD" : Is used where a provision is advisory only.

"SHALL" : Is used where a provision is mandatory.

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0. INTRODUCTION

This Standard specification gives the amendments and supplements to API Standard 671, Third Edition, October 1998, "Special Purpose Couplings for Petroleum, Chemical, and Gas Industry Services". It shall be used in conjunction with data/requisition sheets for Special Purpose Couplings.

Note: This is a revised version of the standard specification for Special Purpose Couplings for process services, which is issued as edition (1) . Edition (0) of the said standard specification is withdrawn.

Guidance for Use of this Standard

The amendments/supplement to API Standard 671 given in this Standard are directly related to the equivalent sections or clauses in API Standard 671. For clarity, the section and paragraph numbering of API Standard 671 has been used as far as possible. Where clauses in API are referenced within this Standard, it shall mean those clauses are amended by this Standard. Clauses in API that are not amended by this Standard shall remain valid as written.

The following annotations, as specified hereunder, have been used at the bottom right hand side of each clause or paragraph to indicate the type of changes made to the equivalent clause or paragraph of API.

Sub. (Substitution): The clause in API is deleted and replaced by the new clause in this Standard.

Del. (Deletion) : The clause in API is deleted without any replacement.

Add. (Addition) : The new clause with the new number is added to the relevant section of API.

Mod. (Modification): Part of the clause or paragraph in API is modified and/or the new description and/or statement is added to that clause or paragraph as given in this Standard

1. GENERAL

1.1 SCOPE

1.1.5 Compliance by the coupling manufacturer with the provisions of this standard specification does not relieve him of the responsibility of furnishing coupling of proper design, mechanically suited to meet guarantees at the specified service conditions. **(Add.)**

1.1.6 Unless specific exception accompanied by a description of the proposed substitute is recorded under the heading "Exception" in manufacturer's proposal, it shall be mutually understood that the proposal is based on equipment which complies strictly with the requirements of this Standard. **(Add.)**

1.2 Alternative Designs

1.2.1 The International System (SI) of Units , dimension and rating in accordance with [IPS-E-GN-100](#) shall be used, Unless otherwise specified. **(Mod.)**

1.3 Conflicting Requirements

In the case of conflict between documents relating to the inquiry or order, the following priority of documents (whichever more stringent realized by Company) shall apply:

- First priority : Purchase order and variations thereto.
- Second priority : Data sheets and drawings.
- Third priority : This Standard Specification.

All conflicting requirements shall be referred to the purchaser in writing. The purchaser will issue conforming documentation if needed for clarification. **(Sub.)**

1.5 Referenced Publications

Throughout this Standard the following dated and undated standards/codes are referred to. These referenced documents shall, to the extent specified herein, form a part of this standard. For dated references, the edition cited applies. The applicability of changes in dated references that occur after the cited date shall be mutually agreed upon by the Company and the Vendor. For undated references, the latest edition of the referenced documents (including any supplements and amendments) applies.

ASME (AMERICAN SOCIETY OF MECHANICAL ENGINEERS)

Boiler and Pressure Vessel Code, Section VIII

"Rules for Construction of Pressure Vessels"

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

A 388 "Practice for Ultrasonic Examination of Heavy Steel Forgings"

IPS (IRANIAN PETROLEUM STANDARDS)

[M-PM-320](#) "Lubrication, Shaft Sealing, and Control Oil systems for Special Purpose Application"

[E-GN-100](#) "Units" **(Mod.)**

2. BASIC DESIGN

2.1 General

2.1.4 Hub type

The hubs shall be removable unless otherwise specified. **(Sub.)**

2.2 Gear Coupling

2.2.7 The lubrication system shall conform to [IPS-M-PM-320](#). **(Mod.)**

2.2.9 It should be recognized that the selection and design of the gear coupling must follow the rotor design work and should exclude the coupling from becoming an item to risk reliability for cost savings. **(Add.)**

2.3 Metallic Flexible Element Coupling

2.3.2 The flexible element shall be positively secured to adjacent parts of coupling by spines, bolts, or welds. Rivets, brazed or sweated connections are not acceptable for transmission of load. **(Mod.)**

2.3.6 Diaphragm coupling rating and design shall be based on the maximum axial and radial misalignment anticipated during transient and steady state conditions. The shaft end clearances for assembly shall be specified by the Vendor. The diaphragms shall be coated with manufacturer's standard coating, suitable for the specified environment. **(Add.)**

2.3.7 Diaphragm coupling spacer piece resonant frequencies shall have at least 10 percent separation margin from all specified operating speed and from two times of all specified operating speed. **(Add.)**

2.6 Balance

2.6.1 General

All coupling components shall be match marked. For coupling requiring assembly balance or assembly check balance, match marking shall be performed after the balance or balance check and prior to subsequent disassembly of the coupling. **(Mod.)**

2.7 Materials

2.7.1 The metallurgy, heat treatment, and testing of all components shall be stated clearly in the Vendor's Proposal. **(Mod.)**

2.7.3 When the environmental or other contaminant contains hydrogen sulfide, materials with hardness in excess of Rockwell C-22 shall not be used. **(Mod.)**

2.7.8 For direct motor driven units, the coupling shall be all steel and have a high torsional stiffness factor. **(Add.)**

4. MANUFACTURING QUALITY, INSPECTION, TESTING AND PREPARATION FOR SHIPMENT

4.3 Inspection

4.3.2 Welds

4.3.2.1 Inspection procedure and acceptance shall be in accordance with the ASME boiler and pressure vessel code, Section VIII, as following:

Radiography, paragraph UW-51; magnetic particle, Appendix VI; and dye penetrant, Appendix VIII.

When ultrasonic inspection is used, the procedures and acceptance criteria shall be in accordance with section VIII, Appendix XII unless otherwise agreed upon. **(Mod.)**

4.3.3 Wrought raw materials

4.3.3.1 Wrought materials shall be free from cracks, seams, laps, shrinkage and other injurious defects.

The Vendor shall ultrasonically inspect according to ASTM A 388 and shall assure the integrity of wrought materials for all torque transmitting parts as early as is practical in the manufacturing cycle. **(Add.)**

4.5 Preparation for Shipment

4.5.2 The expected storage location shall be outdoors in specified environmental conditions. **(Mod.)**

4.5.3 The packing shall be prepared for export shipping. **(Mod.)**

5. VENDOR'S DATA

5.1 General

5.1.2 The following information shall also included:

g) Manufacturer's Name

h) Year of manufacturing **(Mod.)**

5.2 Proposals and Contract Data

5.2.1 General

g) A schedule according to which the vendor agrees to furnish the data requested by the purchaser

h) A list of spare parts recommended for start-up and normal maintenance purpose . (The purchaser will specify any special requirements for long term storage). **(Mod.)**

5.2.4 Curves **(Add.)**

5.2.4.1 The following data shall be provided for gear couplings:

a) Axial force versus torque (from zero to maximum allowable torque) for relative tooth motion. (This curve shall be determined with the coupling at the maximum allowable angular misalignment and shall be on the vendor's stated coefficient of tooth friction).

b) Bending moment versus angular misalignment (This curve shall be determined based on the maximum allowable torque.)

5.2.4.2 The following curves shall be provided for flexible-element couplings:

a) Axial force versus axial deflection (from zero to maximum allowable axial deflection in both directions)

b) Bending moment at maximum angular misalignment versus axial deflection. (from zero to maximum allowable axial deflection in both direction)

c) Windage loss versus coupling speed. (Enclosure data and ambient temperature data at the coupling location will be supplied by the purchaser).

6. GUARANTEE AND WARRANTY

Unless exception is recorded by the Vendor in his proposal, it shall be understood that the Vendor agrees to the following guarantees and warranties:

During a period of 12 months after the date of commissioning, the Vendor shall, with all possible speed and without cost to the purchaser, replace or repair the goods or any part thereof found to be defective due to faulty material, workmanship or to any act or omission of the Vendor. In particular the Vendor shall reimburse any transportation and other charges incurred by the purchaser in effecting such replacement or repair at the point of use. **(Add.)**

Note to Users

The IPS Standards reflect the views of the Iranian Ministry of Petroleum and are intended for use in the oil and gas production facilities, oil refineries, chemical and petrochemical plants, gas handling and processing installations and other such facilities.

IPS publications are based on internationally acceptable standards and include selections from the options stipulated in the referenced standards. They are also supplemented by additional requirements and/or modifications based on the experience acquired by the Iranian Petroleum Industry and the local market availability. The options which are not specified in the text of the standards are itemized in data sheet/s, so that, the user can select his appropriate preferences therein.

The IPS standards are therefore expected to be sufficiently flexible so that the users can adapt these standards to their requirements. However, they may not cover every requirement or diversity of conditions of each project or work.

For such cases, an addendum to IPS Standard shall be prepared by the user which elaborates the particular requirements of the user. This addendum together with the relevant IPS shall form the job specification for the specific project or work.

The users of IPS publications are therefore requested to send their views and comments, including any addendum prepared for particular cases to the Ministry of Petroleum, Standards and Research Organization. These comments and recommendations will be reviewed by the relevant technical committee and will be incorporated in the formal revision of the relevant IPS. The IPS publications are reviewed and revised approximately every five years.

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