

PETRONAS TECHNICAL STANDARDS

DESIGN AND ENGINEERING PRACTICE

RECIPROCATING POSITIVE DISPLACEMENT PUMPS AND METERING PUMPS (AMENDMENTS/ SUPPLEMENTS TO API 674 AND API 675)

PTS 31.29.12.30

NOVEMBER 2010



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PTS Circular 2010 – 31.29.12.30



PTS No:	31.29.12.30
PTS Title:	Reciprocating Positive Displacement Pumps and Metering Pumps (Amendments/ Supplements to API 674 and API 675)

This PTS 31.29.12.30- Reciprocating Positive Displacement Pumps and Metering Pumps (Amendments/ Supplements to API 674 and API 675) has been updated and has incorporated PETRONAS Lessons Learnt, Best Practice and new information issued by relevant industry code and standards. This PTS is still valid and with editorial changes only.

The previous version of this PTS 31.29.12.30 (December 1999) will be removed from PTS binder / e-repository from herein onwards.

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Document Approval

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PREFACE

PETRONAS Technical Standards (PTS) publications reflect the views, at the time of publication, of PETRONAS OPU/Divisions.

They are based on the experience acquired during the involvement with the design, construction, operation and maintenance of processing units and facilities. Where appropriate they are based on, or reference is made to, national and international standards and codes of practice.

The objective is to set the recommended standard for good technical practice to be applied by PETRONAS' OPU/Divisions in oil and gas production facilities, refineries, gas processing plants, chemical plants, marketing facilities or any other such facility, and thereby to achieve maximum technical and economic benefit from standardization.

The information set forth in these publications is provided to users for their consideration and decision to implement. This is of particular importance where PTS may not cover every requirement or diversity of condition at each locality. The system of PTS is expected to be sufficiently flexible to allow individual operating units to adapt the information set forth in PTS to their own environment and requirements.

When Contractors or Manufacturers/Suppliers use PTS they shall be solely responsible for the quality of work and the attainment of the required design and engineering standards. In particular, for those requirements not specifically covered, it is expected of them to follow those design and engineering practices which will achieve the same level of integrity as reflected in the PTS. If in doubt, the Contractor or Manufacturer/Supplier shall, without detracting from his own responsibility, consult the owner.

The right to use PTS rests with three categories of users:

- 1) PETRONAS and its affiliates.
- 2) Other parties who are authorized to use PTS subject to appropriate contractual arrangements.
- 3) Contractors/subcontractors and Manufacturers/Suppliers under a contract with users referred to under 1) and 2) which requires that tenders for projects, materials supplied or - generally - work performed on behalf of the said users comply with the relevant standards.

Subject to any particular terms and conditions as may be set forth in specific agreements with users, PETRONAS disclaims any liability of whatsoever nature for any damage (including injury or death) suffered by any company or person whomsoever as a result of or in connection with the use, application or implementation of any PTS, combination of PTS or any part thereof. The benefit of this disclaimer shall inure in all respects to PETRONAS and/or any company affiliated to PETRONAS that may issue PTS or require the use of PTS.

Without prejudice to any specific terms in respect of confidentiality under relevant contractual arrangements, PTS shall not, without the prior written consent of PETRONAS, be disclosed by users to any company or person whomsoever and the PTS shall be used exclusively for the purpose they have been provided to the user. They shall be returned after use, including any copies which shall only be made by users with the express prior written consent of PETRONAS.

The copyright of PTS vests in PETRONAS. Users shall arrange for PTS to be held in safe custody and PETRONAS may at any time require information satisfactory to PETRONAS in order to ascertain how users implement this requirement.

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PART I INTRODUCTION

This PTS specifies requirements and gives recommendations for reciprocating positive displacement pumps and for metering pumps for use in oil refineries, chemical plants, gas plants and, where applicable, in exploration, production and new ventures.

This PTS gives amendments and supplements to the two corresponding API standards:

- API 674, Second Edition, June 1995, 'Positive Displacement Pumps - Reciprocating'
- API 675, Second Edition, October 1994, 'Positive Displacement Pumps - Controlled Volume'

This PTS shall be used in conjunction with data/requisition sheet PTS 31.29.12.93 for reciprocating pumps.

This PTS is a revision of the PTS of the same number dated July 1983.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by PETRONAS, the distribution of this PTS is confined to companies forming part of PETRONAS or managed by a Group company, and to Contractors and Manufacturers nominated by them (i.e. the distribution code is "F" as defined in PTS 00.00.05.05).

This PTS is intended for use in oil refineries, chemical plants, gas plants and exploration and production facilities.

If national and/or local regulations exist in which some of the requirements may be more stringent than in this PTS the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable as regards safety, environmental, economic and legal aspects. In all cases, the Contractor shall inform the Principal of any deviation from the requirements of this PTS which is considered to be necessary in order to comply with national and/or local regulations. The Principal may then negotiate with the Authorities concerned with the object of obtaining agreement to follow this PTS as closely as possible.

1.3 DEFINITIONS

The **Contractor** is the party which carries out all or part of the design, engineering, procurement, installation, and commissioning or management of a project or operation of a facility. The Principal may sometimes undertake all or part of the duties of the Contractor.

The **Manufacturer/Supplier/Vendor** is the party which manufactures or supplies equipment and services to perform the duties specified by the Contractor.

The **Principal** is the party which initiates the project and ultimately pays for its design and construction. The Principal will generally specify the technical requirements. The Principal may also include an agent or consultant, authorised to act for the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

1.4 CROSS-REFERENCES

Where cross-references to other parts of this PTS are made, the referenced section number is shown in brackets.

Other documents referenced by this PTS are listed in IV.

PART II GENERAL INFORMATION

This PTS is written in four parts, of which Part III gives amendments and supplements to API 674, Second Edition, June 1995, and to API 675, Second Edition, October 1994.

Reciprocating positive displacement pumps, direct-acting and power frame types, shall conform to API 674, as amended or supplemented by this PTS.

Metering pumps shall conform to API 675, as amended or supplemented by this PTS, and to those amendments/supplements to API 674 indicated by the letter "M" in the margin.

For ease of reference, the clause numbering of API 674 has been used throughout Part III of this PTS.

Where an amendment or supplement to a clause in API 674 applies equally to a corresponding clause in API 675, the instruction relative to the clause concerned in API 674 also identifies the corresponding clause in API 675.

When there is no corresponding clause in API 675 to which reference can be made, when required, the symbol (M) in the left-hand margin indicates where metering pumps shall comply with the amendment/supplement concerned.

Clauses in API 674 and in API 675 not mentioned shall remain valid as written.

A bullet (•) in the margin against certain clauses in API 674 and API 675 indicates that a decision by the Principal is required. These decisions shall be indicated directly in data/requisition sheet PTS 31.29.12.93, when provisions are made for them; otherwise, they shall be indicated in the data/requisition sheet(s) under the heading 'Additional Requirements', or stated in the purchase order.

PART III AMENDMENTS/SUPPLEMENTS TO API 674 AND API 675

SECTION 1 GENERAL

1.1 SCOPE

Replace this clause and note, and 1.1 and note of API 675, by:

This PTS covers the minimum requirements for reciprocating positive displacement pumps.

Direct-acting and power frame type pumps and metering pumps are covered by this PTS. Metering pumps include both packed-plunger and diaphragm types; diaphragm pumps that use direct mechanical actuation are excluded.

1.3 CONFLICTING REQUIREMENTS

Replace this clause, and 1.3 of API 675, by:

In the event of conflict between documents relating to the inquiry or order, the following priority of documents shall apply:

- first priority: purchase order and variations thereto;
- second priority: data/requisition sheets and drawings;
- third priority: this PTS.

1.4 DEFINITION OF TERMS

Add new clause (and 1.4.29 of API 675):

1.4.27 Continuous operation

Unless otherwise specified, the term continuous operation, when used on data/requisition sheets, shall mean: Uninterrupted operation for a period of at least 24 000 hours at the specified operating conditions.

Add new clause (and 1.4.30 of API 675):

1.4.28 Intermittent operation

Unless otherwise specified, the term intermittent operation, when used on data/requisition sheets, shall mean: Any operation which is not classed as continuous operation. This definition may apply to such duties as:

- pumps started up and stopped automatically at intervals by process operated controls;
- pumps started up and stopped at intervals by manual control for the batch transfer of liquid.

Add new clause (and 1.4.31 of API 675):

1.4.29 hazardous service

service comprising the following categories, which shall be specified on the data/requisition sheets:

Category 1

- Liquids classified as "very toxic - acute" in PTS 01.00.01.30.
- Liquids containing ethylene oxide

Category 2

- Liquids classified as "very toxic - chronic" in PTS 01.00.01.30.
- Hydrocarbon liquids at an operating temperature above their auto-ignition temperature.

Category 3

- Hydrocarbon liquids with a seal chamber vapour pressure higher than 500 kPa (abs) [73 psia];

- Light hydrocarbon services (ISO 21049:2004, Clause 3.38).