

PETRONAS TECHNICAL STANDARDS

DESIGN AND ENGINEERING PRACTICE

PRINTED CIRCUIT HEAT EXCHANGERS- SELECTION AND APPLICATION

PTS 31.21.01.11

JANUARY 2010



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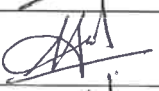
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This revision of PTS 31.21.01.11 – Printed Circuit Heat Exchangers – Selection and application (January 2010, Revision 1) has been updated to incorporate PETRONAS Lessons Learnt, Best Practice and new information issued by relevant industry code and standards. All updates in the document are highlighted in *italic* font.

The previous version of this PTS 31.21.01.11 (January 2005) will be removed from PTS binder / e-repository from herein onwards.

Document Approval

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PREFACE

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

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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' OPUs 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 standardisation.

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.

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TABLE OF CONTENTS

1.0	INTRODUCTION	5
1.1	SCOPE.....	5
1.2	DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATION.....	5
1.3	DEFINITIONS.....	5
1.4	CROSS-REFERENCES.....	5
1.5	SUMMARY OF CHANGES SINCE PREVIOUS EDITION.....	6
2.0	GENERAL INFORMATION	7
2.1	DESCRIPTION.....	7
2.2	CONSTRUCTION OF A PRINTED CIRCUIT HEAT EXCHANGER.....	9
3.0	THERMAL AND HYDRAULIC DESIGN CONSIDERATIONS	12
3.1	TEMPERATURE AND PRESSURE LIMITATIONS.....	12
3.2	PROCESS CRITICALITY.....	12
3.3	DUTY/SIZE LIMITATIONS.....	12
3.4	MINIMUM TEMPERATURE DIFFERENTIAL.....	12
3.5	MAXIMUM TEMPERATURE DIFFERENTIAL.....	13
3.6	PROCESS CONTROL STABILITY.....	13
3.7	PERFORMANCE MONITORING.....	14
3.8	THERMAL FATIGUE.....	14
3.10	PROCESS FLUID CHARACTERISTICS.....	15
3.11	FLUID VELOCITIES.....	16
3.12	DEPRESSURISATION.....	16
4.0	MECHANICAL DESIGN CONSIDERATIONS	17
4.1	LOAD CASES.....	17
4.2	PRESSURE AND THERMAL CYCLING.....	17
4.3	STRUCTURAL INTEGRITY.....	17
4.4	HEADERS AND NOZZLES.....	17
4.5	SAFETY AND MAINTENANCE.....	17
4.6	RUPTURE HAZARD.....	18
4.7	PRESSURE TESTING.....	18
5.0	MATERIALS OF CONSTRUCTION	19
6.0	REFERENCES	19

1. INTRODUCTION

1.1 SCOPE

This PTS shall fully adopt **PTS 31.21.01.11- Printed Circuit Heat Exchangers – Selection and Application (January 2005)**. In addition to this, the custodian of this PTS has assess/review/evaluate the stated PTS and offered the following exceptions/amendments. This PTS also includes PETRONAS Lessons Learnt and PETRONAS Best Practice for the subject matter as stated above.

The use of this PTS shall therefore take into consideration of PTS 31.21.01.11 all the exceptions/amendments referred to PTS, as well as any PETRONAS Lessons Learnt and PETRONAS Best Practices related to the subject matter

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

The distribution of this PTS is confined to companies forming part of the Royal Dutch/Shell Group or managed by a Group company and, where necessary, to Contractors and Manufacturers nominated by them.

This PTS is intended for use in oil refineries, chemical plants, gas plants, exploration and production facilities and, where applicable, supply/marketing installations.

When PTSs are applied, a Management of Change (MOC) process should be implemented; this is of particular importance when existing facilities are to be modified.

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 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 that carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project, or operation or maintenance of a facility. The Principal may undertake all or part of the duties of the Contractor.

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

The **Principal** is the party that 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, and on behalf of, 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 (6).

1.5 SUMMARY OF CHANGES SINCE PREVIOUS EDITION

The previous edition of this PTS was dated January 2005. Other than editorial changes, a summary of the main changes since the last edition is given below:

Section	Change
4.6	Statement added: The maximum relief rate shall be based on a complete rupture running longitudinal to a corrugation and the area for flow for tube rupture should be taken to be equal to the area of one orifice of 2 mm diameter. Statement refers to PTS 31.21.01.11.
Reference	PTS 31.21.01.11 - Printed Circuit Heat Exchangers – Selection and Application –January 2005