

Burner - Material Requisition

Standardization

This Standard replaces and cancels its previous revision.

The CONTEC - Authoring Subcommittee provides guidance on the interpretation of this Standard when questions arise regarding its contents. The Department of PETROBRAS that uses this Standard is responsible for adopting and applying the sections, subsections and enumerates thereof.

Technical Requirement: A provision established as the most adequate and which shall be used strictly in accordance with this Standard. If a decision is taken not to follow the requirement ("non-conformity" to this Standard) it shall be based on well-founded economic and management reasons, and be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by imperative nature.

Recommended Practice: A provision that may be adopted under the conditions of this Standard, but which admits (and draws attention to) the possibility of there being a more adequate alternative (not written in this Standard) to the particular application. The alternative adopted shall be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by verbs of a nonmandatory nature. It is indicated by the expression: **[Recommended Practice]**.

Copies of the registered "non-conformities" to this Standard that may contribute to the improvement thereof shall be submitted to the CONTEC - Authoring Subcommittee.

Proposed revisions to this Standard shall be submitted to the CONTEC - Authoring Subcommittee, indicating the alphanumeric identification and revision of the Standard, the section, subsection and enumerate to be revised, the proposed text, and technical/economic justification for revision. The proposals are evaluated during the work for alteration of this Standard.

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CONTEC

Comissão de Normalização
Técnica

SC - 08

Fired Heaters

Introduction

PETROBRAS Technical Standards are prepared by Working Groups - WG (consisting specialized of Technical Collaborators from Company and its Subsidiaries), are commented by Company Units and its Subsidiaries, are approved by the Authoring Subcommittees - SCs (consisting of technicians from the same specialty, representing the various Company Units and its Subsidiaries), and ratified by the Executive Nucleus (consisting of representatives of the Company Units and its Subsidiaries). A PETROBRAS Technical Standard is subject to revision at any time by its Authoring Subcommittee and shall be reviewed every 5 years to be revalidated, revised or cancelled. PETROBRAS Technical Standards are prepared in accordance with PETROBRAS Technical Standard [N-1](#). For complete information about PETROBRAS Technical Standards see PETROBRAS Technical Standards Catalog.

Foreword

This Standard is the English version of PETROBRAS N-2227 REV. F 05/2019. In case of doubt, the Portuguese version, which is the valid document for all intents and purposes, shall be used.

1 Scope

1.1 This Standard standardizes the Burner Request Form for use in the acquisition of any over burner for PETROBRAS.

1.2 This Standard applies to purchases or orders from the date of its edition.

1.3 This Standard contains only Technical Requirements.

2 Normative References

The documents listed below are essential for the application of this document. For dated references, only the cited editions are applicable. For undated references, the latest editions of the mentioned documents (including amendments) apply.

INMETRO - Portaria nº 83 de 03/04/2006 - Aprovar o regulamento de avaliação de conformidade de equipamentos elétricos para atmosferas explosivas, nas condições de gases e vapores inflamáveis;

Norma Regulamentadora nº 10 (NR-10) – Segurança em Instalações e Serviços em Eletricidade;

Norma Regulamentadora nº 13 (NR-13) - Caldeiras, Vasos de Pressão, Tubulações e Tanques Metálicos de Armazenamento;

Norma Regulamentadora nº 14 (NR-14) - Fornos;

Resolução CONAMA nº 382 de 26/12/2006 - Estabelece os limites máximos de emissão de poluentes atmosféricos para fontes fixas;

Resolução CONAMA nº 436 de 26/12/2011 - Estabelece os limites máximos de emissão de poluentes atmosféricos para fontes fixas instaladas ou com pedido de licença de instalação anteriores a 02 de janeiro de 2007;

PETROBRAS N-2 - Anticorrosive Coating of Industrial Equipment;

PETROBRAS N-13 - Requisitos Técnicos para Serviços de Pintura;

PETROBRAS N-58 - Graphic Symbols for Process and Engineering Flowsheets;

PETROBRAS N-59 - Símbolos Gráficos para Desenhos de Tubulação;

PETROBRAS N-75 - Abbreviations for Industrial Designs;

PETROBRAS N-133 - Soldagem;

PETROBRAS N-250 - Installation of High Temperature Thermal Insulation;

PETROBRAS N-279 - Design of Steel Structures;



PETROBRAS [N-381](#) - Engineering Technical Documents Templates;

PETROBRAS [N-550](#) - Projeto de Isolamento Térmico a Alta Temperatura;

PETROBRAS [N-858](#) - Construção, Montagem e Condicionamento de Instrumentação;

PETROBRAS [N-1021](#) - Pintura de Aço Galvanizado, Aço Inoxidável, Ferro Fundido, Ligas não Ferrosas, Materiais Compósitos Poliméricos e Termoplásticos;

PETROBRAS [N-1219](#) - Cores;

PETROBRAS [N-1438](#) - Terminologia Soldagem;

PETROBRAS [N-1521](#) - Identification of Industrial Equipment;

PETROBRAS [N-1550](#) - Pintura de Estrutura Metálica;

PETROBRAS [N-1591](#) - Metal Alloys and Metals - Identification by Magnet and Spot Tests;

PETROBRAS [N-1594](#) - Ensaio Não Destrutivo - Ultrassom em Solda;

PETROBRAS [N-1595](#) - Ensaio Não Destrutivo - Radiografia;

PETROBRAS [N-1596](#) - Ensaio Não Destrutivo - Líquido Penetrante;

PETROBRAS [N-1597](#) - Ensaio Não Destrutivo - Visual;

PETROBRAS [N-1618](#) - Thermal Insulation Material;

PETROBRAS [N-1637](#) - Fired Heater Assembly;

PETROBRAS [N-1664](#) - Fired Heater - Data Sheet;

PETROBRAS [N-1665](#) - Burner - Data Sheet;

PETROBRAS [N-1671](#) - Design and Fabrication of Furnace;

PETROBRAS [N-1710](#) - Coding of Technical Engineering Documents;

PETROBRAS [N-1882](#) - Criteria for Development of Instrumentation Designs;

PETROBRAS [N-1883](#) - Apresentação de Projeto de Instrumentação/Automação;

PETROBRAS [N-2064](#) - Emissão e Revisão de Documentos de Projeto;

PETROBRAS [N-2105](#) - Fired Heater - Material Requisition;

PETROBRAS [N-2301](#) - Elaboração da Documentação Técnica de Soldagem;

PETROBRAS [N-2802](#) - Folhas de Dados de Instrumentação Coletânea;

PETROBRAS [N-2833](#) - Forms and Lists for Instrumentation Designs;

ABNT [NBR 10778](#) - Forno Tubular Sujeito à Chama - Terminologia;

ABNT [NBR 15218](#) - Critérios para Qualificação e Certificação de Inspetores de Pintura Industrial;

ABNT [NBR 15523](#) - Qualificação e Certificação de Inspetor de Controle Dimensional;

ABNT [NBR 16137](#) - Ensaios Não Destrutivos - Identificação de Materiais por Teste por Pontos, Espectrometria por Fluorescência de Raios X e Espectrometria por Emissão Óptica;

ABNT [NBR 16278](#) - Inspeção de Fabricação - Qualificação e Certificação de Pessoas para o Setor de Petróleo e Gás;

API [RP 535](#) - Burners for Fired Heaters in General Refinery Services;

API [STD 560](#) - Fired Heaters for General Refinery Services;

ISA [5.1](#) – Instrumentation, Symbols and Identification

3 General Conditions

3.1 The Requisition for Material in Annex A, after completed, constitutes the initial document of the burner acquisition, and must constitute a permanent document of the equipment.

3.2 The same Material Requirement shall be used for one or more burners, however all the information, requirements and requisite detailed in the various items are valid for all burners included in the Material Requisition.

3.3 The Material Requisition form is standardized in A4 format according to Annex A.

3.4 To complete the header and footer of the Material Requisition in Exhibit A, must obey PETROBRAS [N-381](#).


3.5 The applicable Appendix of PETROBRAS [N-381](#) shall be used for the continuation of any item that does not fit in Annex A.

3.6 The burner identification must be in accordance with PETROBRAS [N-1521](#) and written in the header field referring to the equipment name in the right-hand corner. In case the space is insufficient, fill in this field with: "SEE SECTION 1".

3.7 PETROBRAS [N-1671](#) and ABNT [NBR 10778](#) must be followed to fulfill the Material Requirement in Annex A.


3.8 Annex A to this Standard shall consist of the form mentioned in 3.3.

[illegible]

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1. OBJECTIVE OF THE REQUISITION

1.1 This Material Requisition (RM) is intended for the supply of the following burners:

IDENTIFICATION OF THE BURNER	QUANTITY	IDENTIFICATION OF THE EQUIPMENT WHERE THE BURNER IS TO BE INSTALLED

1.2 The supply will only be considered complete if all that is required in the technical documentation was provided.

1.3 Only more than one burner can be included in the same RM, if all are for the same equipment.

1.4 Alternatives and/or deviations from the specifications should be presented separately in a "List of Deviations".

1.4.1 The alternatives and/or deviations presented in the "List of deviations", after being approved, become an integral part of this Material Requisition.


1.4.2 Information not contained in the "List of Deviations" is not analyzed, and the proposal remains strictly in accordance with the RM and its annexes.

1.5 Only proposals that fully meet the requirements specified in this material requisition will be accepted.

2. SCOPE OF SUPPLY

The burner supplier must supply the items marked below:

- ☐ Burner and Refractor Blocks
- ☐ Ignition System
- ☐ Pilot
- ☐ Noise Muffler
- ☐ Electrical Connections
- ☐ Flame detection Device
- ☐ Assembly (According to PETROBRAS N-1637)
- ☐ Packing and Preparation for Shipping
- ☐ Field Mounting Supervision
- ☐ Conditioning Supervision
- ☐ Pre-operation Supervision
- ☐ Spare Parts (According to Item 3)
- ☐ Study of the Adequacy of the Flame Envelope to the Combustion Chamber
- ☐ Guarantee of Adequacy of the Flame Envelope to the Combustion Chamber
- ☐ Study of the Suitability of the Air Distribution System

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- ☐ Guarantee of Suitability of the Air Distribution System
- ☐ Adequacy Study of the Mechanical Vibration within the Acceptable Limits
- ☐ Guarantee of Acceptance of Vibration to Acceptable Limits
- ☐ Plating Modification Project and Structures for the Installation of the Burner
- ☐ Guarantee of Atmospheric Emissions According to the Burner Specification Documentation
- ☐ Training for Operation and Maintenance Teams as Specified

3. SPARE PARTS LISTS

- 3.1. The Supplier shall provide all necessary spares parts in the burner scope of this material requisition during assembly period.
- 3.2. The list of spare parts for two years for continuous operation, presented below, should be considered as minimal. The Supplier shall supplement this list with other items deemed necessary for two years of continuous operation.
- 3.3. The Supplier shall submit, with the proposal, a complete list of spare parts required for continuous two years operation, including the recommended quantity and unit price of each item.
- 3.4. Spare parts must be identified in accordance with the drawings and / or documents provided (this also applies to spare parts supplied by third parties).
- 3.5. Spare for two years of operation:
- ☐ Refractory Burner Block 5% (or 1 set, whichever is greater)
 - ☐ Burner Gas Nozzle 10% (or 1 set, whichever is greater)
 - ☐ Burner Oil Gun 10% (or 1 set, whichever is greater)
 - ☐ Pilot 5% (or 1 set, whichever is greater)
 - ☐ Ignition System 1 Kit
 - ☐ Burner 1 Kit

4. ATTACHED DOCUMENTS


The proposals should be in compliance with all the applicable technical requirements specified in the documents attached and listed below that will be an integral part of this MR.

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5. REFERENCE DOCUMENTS

Proposals must be in full compliance with all technical requirements specified in the documents listed below, which are an integral part of this RM.


Document	Revision/Amendment	Title
Internacional Standards and Codes		
<input type="checkbox"/> API STD 560		Fired Heaters for General Refinery Services
<input type="checkbox"/> API RP 535		Burners for Fired Heaters in General Refinery Services
<input type="checkbox"/> ISA 5.1		Instrumentation Symbols and Identification
PETROBRAS Standards		
<input type="checkbox"/> N-2		Anticorrosive Coating of Industrial Equipment
<input type="checkbox"/> N-13		Requisitos Técnicos Para Serviços de Pintura
<input type="checkbox"/> N-58		Graphic Symbols for Process and Engineering Flowsheets
<input type="checkbox"/> N-59		Símbolos Gráficos para Desenhos de Tubulação
<input type="checkbox"/> N-75		Abbreviations for Industrial Designs
<input type="checkbox"/> N-133		Soldagem
<input type="checkbox"/> N-250		Installation of High Temperature Thermal Insulation
<input type="checkbox"/> N-279		Design of Steel Structures
<input type="checkbox"/> N-293		Manufacture and Assembly of Metallic Structures
<input type="checkbox"/> N-381		Engineering Technical Documents Templates
<input type="checkbox"/> N-550		Projeto de Isolamento Térmico a Alta Temperatura
<input type="checkbox"/> N-858		Construção, Montagem e Condicionamento de Instrumentação
<input type="checkbox"/> N-1021		Pintura de Aço Galvanizado, Aço Inoxidável, Ferro Fundido, Ligas não Ferrosas, Materiais Compósitos Poliméricos e Termoplásticos
<input type="checkbox"/> N-1219		Cores
<input type="checkbox"/> N-1438		Terminologia Soldagem
<input type="checkbox"/> N-1521		Identification of Industrial Equipment
<input type="checkbox"/> N-1550		Pintura de Estrutura Metálica
<input type="checkbox"/> N-1591		Metal Alloys and Metals - Identification by Magnet and Spot Tests

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Document**Revision/Amendment****Title**

- | | |
|---------------------------------|--|
| <input type="checkbox"/> N-1594 | Ensaio Não Destrutivo – Ultrassom em Solda |
| <input type="checkbox"/> N-1595 | Ensaio Não Destrutivo – Radiografia |
| <input type="checkbox"/> N-1596 | Ensaio Não Destrutivo – Líquido Penetrante |
| <input type="checkbox"/> N-1597 | Ensaio Não Destrutivo – Visual |
| <input type="checkbox"/> N-1618 | Thermal Insulation Material |
| <input type="checkbox"/> N-1637 | Fired Heater Assembly |
| <input type="checkbox"/> N-1664 | Fired Heater - Data Sheet |
| <input type="checkbox"/> N-1665 | Burner - Data Sheet |
| <input type="checkbox"/> N-1671 | Design and Fabrication of Furnace |
| <input type="checkbox"/> N-1710 | Coding of Technical Engineering Documents |
| <input type="checkbox"/> N-1882 | Criteria for Development of Instrumentation Designs |
| <input type="checkbox"/> N-1883 | Apresentação de Projeto de Instrumentação /Automação |
| <input type="checkbox"/> N-2064 | Emissão e Revisão de Documentos de Projeto |
| <input type="checkbox"/> N-2105 | Fired Heater - Material Requisition |
| <input type="checkbox"/> N-2301 | Elaboração da Documentação Técnica de Soldagem |
| <input type="checkbox"/> N-2802 | Collection of Instrumentation Data Sheets |
| <input type="checkbox"/> N-2833 | Forms and Lists for Instrumentation Designs |

PETROBRAS Operating Procedures

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Document	Revision/Amendment	Title
Brazilian Standards		
<input type="checkbox"/> ABNT NBR 10778		Forno Tubular Sujeito à Chama - Terminologia
<input type="checkbox"/> ABNT NBR 15218		Critérios para Qualificação e Certificação de Inspectores de Pintura Industrial
<input type="checkbox"/> ABNT NBR 15523		Qualificação e Certificação de Inspetor de Controle Dimensional
<input type="checkbox"/> ABNT NBR 16137		Ensaio Não Destrutivo - Identificação de Materiais por Teste por Pontos, Espectrometria por Fluorescência de Raios X e Espectrometria por Emissão Óptica
<input type="checkbox"/> ABNT NBR 16278		Inspeção de Fabricação - Qualificação e Certificação de Pessoas para o Setor de Petróleo e Gás
Brazilian Laws		
<input type="checkbox"/> Ministério do Trabalho - NR10		Segurança em Instalações e Serviços em Eletricidade
<input type="checkbox"/> Ministério do Trabalho - NR13		Caldeiras, Vasos de Pressão, Tubulações e Tanques Metálicos de Armazenamento
<input type="checkbox"/> Ministério do Trabalho - NR14		Fornos
<input type="checkbox"/> Resolução Conama		Nº 382 de 26/12/2006
<input type="checkbox"/> Resolução Conama		Nº 436 de 26/12/2011
<input type="checkbox"/> Local Laws of Environmental Control		
<input type="checkbox"/> INMETRO		Portaria Nº 83 de 03/04/2006

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6. COMMENTS AND APPROVAL OF DOCUMENTS


NOTES:

- ✓ (1) The manufacture of each burner part / component / accessory must only be commenced upon approval without comment, or comment, since the comments are satisfied.
- ✓ (2) All documents must contain the identification of the specific burner.
- (3) All documents must contain the Purchase Order number corresponding to this RM.

7. REQUIRED DOCUMENTS

The quantities and deadlines for the presentation of documents must be in accordance with the following table:


Item	Description	Quantities			Deadlines				
		With the Proposal	For Comments	Certified Originals	Presentation (Days After AFM)	Comments (Days After Receipt)	Review (Days After Receipt)	Documents for Approval	Delivery of Originals (Days After Approval)
7.1	Statement of Attendance according to subsection 8.1 of this RM								
7.2	Complete list of documents issued								
7.3	Delivery Schedule								
7.4	List of sub-suppliers and respective sub-supplies								
7.5	List of deviations								
7.6	Burner data sheet filled by manufacturer								
7.7	Burner Performance Test Procedure								
7.8	Performance Curves								
7.9	Noise Level								

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Item	Description	Quantities			Deadlines				
		With the Proposal	For Comments	Certified Originals	Presentation (Days After AFM)	Comments (Days After Receipt)	Review (Days After Receipt)	Documents for Approval	Delivery of Originals (Days After Approval)
7.10	Dimensional drawings (including weights)								
7.11	Installation and assembly details								
7.12	Additional information for Operation								
7.13	Utility consumption sheet								
7.14	Auxiliary systems diagram								
7.15	Manual for installation, operation and maintenance								
7.16	List of spare parts with prices								
7.17	Unitary price sheet of related items in Section 2								
7.18	Technical documentation manual								
7.19	Material quality certificates								
7.20	Welding Procedure								
7.21	Manufacturing Inspection Plan								
7.22	Quality assurance documents								
7.23	Calculation memory of the suitability of the flame envelope to the combustion chamber								
7.24	Calculation memory of the suitability of the air distribution system								

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETY OF PETROBRAS AND MAY NOT BE USED FOR PURPOSES OTHER THAN THOSE SPECIFICALLY INDICATED HEREIN.

THIS FORM IS PART OF PETROBRAS N-2227 REV. F ANNEX A - SHEET 09/12


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Item	Description	Quantities			Deadlines				
		With the Proposal	For Comments	Certified Originals	Presentation (Days After AFM)	Comments (Days After Receipt)	Review (Days After Receipt)	Documents for Approval	Delivery of Originals (Days After Approval)
7.25	Memory of Vibration Suitability Calculations to Acceptable Limits								

NOTES:

- (1) The Manual of Technical Manufacturing Data (Manual of Mechanical Data) must be supplied with the delivery of the burner.
- (2) The project documents issued must be provided in PDF format and in accordance with the following standards:
 - a) All drawings, generated automatically or interactively, must be presented in AutoCAD^{®1)} software format in an agreed version with the client.
 - b) All text documents, including Technical Specifications, Data Sheets, Memories, Descriptions, Operation Manuals, etc. must be provided in the version of MICROSOFT Word^{®2)} for Windows^{®3)} software agreed with the customer.
 - c) All documents generated in spreadsheet format, such as Data Sheets, Calculation Memories, Charts etc. must be provided in the version of MICROSOFT Excel^{®4)} software for Windows^{®3)} agreed with the customer.
 - d) The documents in the final "as-built" version, part of the project documentation, must be provided to PETROBRAS on CD-ROM in uncompressed file format.

- 1) AutoCAD is the trade name of software provided by Autodesk Inc. This information is given to facilitate users of this standard and does not constitute an endorsement by PETROBRAS of the product cited. Equivalent products may be used since they produce the same results.
- 2) Word is the trade name of software provided by Microsoft. This information is given to facilitate users of this standard and does not constitute an endorsement by PETROBRAS of the product cited. Equivalent products may be used since they produce the same results.
- 3) Windows is the trade name of software provided by Microsoft. This information is given to facilitate users of this standard and does not constitute an endorsement by PETROBRAS of the product cited. Equivalent products may be used since they produce the same results.
- 4) Excel is the trade name of software provided by Microsoft. This information is given to facilitate users of this standard and does not constitute an endorsement by PETROBRAS of the product cited. Equivalent products may be used since they produce the same results.

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8. DOCUMENTS REQUIRED WITH THE PROPOSAL

8.1 The proposal must include a declaration in one of the alternatives below:

8.1.1 The express statement that the proposal fully meets all RM items (cite number and revision) and its annexes, supplemented by circular letters, without any technical deviations

8.1.2 The express statement that the proposal meets all RM items (cite number and revision) and its annexes, supplemented by circular letters, less of the deviations (present List of Deviations).

8.2 In addition to the declaration of agreement required in subsection 8.1 above, the SUPPLIER shall submit, together with the Technical Proposal, only the documents indicated in the column. With the Proposal in the table of Section 7.

8.3 Any other information not required by subsections 8.1 and 8.2 above will not be analyzed. In any case, the Technical Proposal should not repeat information, descriptions, data, dimensions, etc. which are already being cited in the RM and its annexes. Therefore, any information not required will be considered invalid.

9. COMPLEMENTARY TECHNICAL REQUIREMENTS

9.1 Sub-Suppliers

9.1.1 All equipment, materials, services, documents, etc. provided by sub-contractors must be in accordance with the requirements of this RM, including documents attached or referenced therein.

9.1.2 Only sub-contractors approved by PETROBRAS may provide items related to the subject of this RM.


9.2 Warranties

9.2.1 The approval of drawings and other documents by PETROBRAS does not exempt the provision of its responsibility for the accuracy of the design, construction and performance of the burner. The burner and its components and accessories must be guaranteed by the supplier (within its limit of supply) for a period of 12 months from the start of operation.

9.2.2 The warranty shall cover, within the scope of delivery, any deficiency in performance, design, material selection or manufacturing defects identified by PETROBRAS at any time during manufacture, inspection, testing, transportation or during the warranty period defined above. In the case of not being satisfied to guarantee burner performance, the supplier must modify or replace at its expense the burner to meet performance guarantee.

9.2.3 The defects or faults must be corrected immediately after their occurrence or verification without any liens for PETROBRAS. All expenses arising from the supply and installation of components or accessories, including transportation to the location, where necessary, are borne by the supplier.

9.2.4 Problems of corrosion, erosion and natural wear are not considered as defects except when, at the supplier's suggestion, any material used is different from that specified by PETROBRAS or when such problems arise from design or manufacturing deficiencies

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THIS FORM IS PART OF PETROBRAS N-2227 REV. F ANNEX A - SHEET 12/12			

INDEX OF REVISIONS

REV. A and B

There is no index of revisions.

REV. C

Affected Parts	Description of Alteration
	Revalidation

REV. D

Affected Parts	Description of Alteration
	Revalidation

REV. E

Affected Parts	Description of Alteration
All	Revised

REV. F

[illegible]