

CONTEC
Comissão de Normalização
Técnica

SC-08
Fired Heaters

Burner - Data Sheet

1st Erratum

This is the 1st Erratum to PETROBRAS N-1665 REV. E and it is used to alter the text of the Standard in the part(s) indicated below:

NOTE 1 The new(s) page(s) with the performed amendment(s) is (are) placed in its corresponding position(s).

NOTE 2 The corrected pages, indicated the date of the erratum, are placed at the end of this standard, in chronological order, and shall not be used.

CONTENTS OF THE 1st ERRATUM - 11/2015

- Annex A and Annex B

Formatting adjustments in forms that do not compromise the technical content.

Burner - Data Sheet

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.

"The present Standard is the exclusive property of PETRÓLEO BRASILEIRO S.A. - PETROBRAS, for internal use in the Company, and any reproduction for external use or disclosure, without previous and express authorization from the owner, will imply an unlawful act pursuant to the relevant legislation through which the applicable responsibilities shall be imputed. External circulation shall be regulated by a specific clause of Secrecy and Confidentiality pursuant to the terms of intellectual and industrial property law."

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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 (issued in 03/2011) of PETROBRAS N-1665 REV. E 12/2010. 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 Data Sheets for burner, to be used in the PETROBRAS designs.

1.2 This Standard applies to designs starting from its issue date.

1.3 This Standard only contains Technical Requirements

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies..

PETROBRAS [N-381](#) - Execution of Drawing and Other General Technical Documents;

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

PETROBRAS [N-1671](#) - Projeto de Fabricação de Forno;

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

[ISO 13705](#) - Petroleum, Petrochemical and Natural Gas Industries - Fired Heaters for General Refinery Service.

NOTE 1 The [ISO 13705](#) has identical contents to the API [STD 560](#) - Petroleum, Petrochemical and Natural Gas Industries - Fired Heaters for General Refinery Service.

NOTE 2 For documents referred in this Standard and for which only the Portuguese version is available, the PETROBRAS department that uses this Standard should be consulted for any information required for the specific application.

3 General Requirements

3.1 This Standard is founded on the [ISO 13705](#) Data Sheet.

3.2 The Data Sheet forms in the Annexes A and B are used to record the purchaser's requirements and the design details of the supplier and, after filled out, it shall constitute a permanent document for the equipment.

3.3 The Data Sheet forms in the Annexes A and B are standardized in the A4 size as shown in the:

- a) Annex A: form with units in the Engineering System;
- b) Annex B: form with units in the International System of Units - SI.

3.4 The requirements of PETROBRAS [N-381](#) shall be met for filling out the heading and footnote of the Data Sheet in the Annexes A and B.

3.5 The applicable Annex of PETROBRAS [N-381](#) shall be used if additional space is required for continuing any item which does not fit in the Annex A or B here to.

3.6 The tag number of the fired heater shall be in accordance with PETROBRAS [N-1521](#) and inserted in the heading space reserved for the title Fired Heater, on the right hand corner.

3.7 PETROBRAS [N-1671](#) and ABNT [NBR 10778](#) shall be used for filling out the Data Sheet in the Annexes A and B.

3.8 In the filling of Data Sheet in the Annexes A and the B the following requirements shall be followed:

- a) to only fill the applicable fields, eliminating, with a horizontal trace, the not applicable fields to the specific project;
- b) in the blank lines, to add eventual complementary data of the specific project.

3.9 The Annexes A and B of this Standard are constituted by two forms conform 3.3. Primary reproduced forms can be supplied by CONTEC. These forms can be available in the site: <http://nortec.engenharia.petrobras.com.br/formzip/NI-1665E.zip>

	DATA SHEET		No.						
	CLIENT:			SHEET	of				
	PROGRAM:			C.C.					
	AREA:								
TITLE:			BURNER						
INDEX OF REVISIONS									
REV.	DESCRIPTION AND/OR REVISED SHEETS								
	ORIGINAL	REV. A	REV. B	REV. C	REV. D	REV. E	REV. F	REV. G	REV. H
DATE									
DESIGN									
EXECUTION									
CHECK									
APPROVAL									
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		DATA SHEET	Nº	Rev.	
		AREA:	SHEET of		
		TITLE:			
		BURNER			
1	GENERAL DATA				REV.
2	EQUIPMENT IDENT. WITH BURNER:				
3	TYPE OF HEATER				
4	ALTITUDE ABOVE SEA LEVEL, m				
5	AIR SUPPLY:				
6	AMBIENT/PREHEATED AIR/GAS TURBINE EXHAUST				
7	TEMPERATURE, °C (MIN./MAX./DESIGN)				
8	RELATIVE HUMIDITY %				
9	DRAUGHT TYPE: FORCED / NATURAL / INDUCED				
10	DRAUGHT AVAILABLE ACROSS BURNER, mmH ₂ O				
11	ACROSS PLENUM, mm H ₂ O				
12	REQUIRED TURNDOWN				
13	BURNER-WALL LINING THICKNESS, mm				
14	HEATER-CASING THICKNESS, mm				
15	FIREBOX HEIGHT, mm				
16	TUBE-CIRCLE DIAMETER, mm				
17	BURNER DATA				
18	MANUFACTURER				
19	TYPE OF BURNER				
20	MODEL/SIZE				
21	DIRECTION OF FIRING				
22	LOCATION (ROOF/FLOOR/SIDEWALL)				
23	NUMBER REQUIRED				
24	MINIMUM DISTANCE BURNER CENTRE-LINE, mm				
25	TO TUBE CENTRE-LINE (HORIZONTAL/VERTICAL)				
26	TO ADJACENT BURNER CENTRE-LINE (HORIZONTAL/VERTICAL)				
27	TO UNSHIELDED REFRACTORY (HORIZONTAL/VERTICAL)				
28	BURNER-CIRCLE DIAMETER, mm				
29	PILOTS:				
30	NUMBER REQUIRED				
31	TYPE				
32	IGNITION METHOD				
33	FUEL				
34	FUEL PRESSURE, kgf/cm ² (ga)				
35	CAPACITY, 10 ⁶ kcal/h				
36	OPERATING DATA				
37	FUEL				
38	HEAT RELEASE PER BURNER, 10 ⁶ kcal/h (LHV)				
39	DESIGN				
40	NORMAL				
41	MINIMUM				
42	EXCESS AIR @ DESIGN HEAT RELEASE, (%)				
43	AIR TEMPERATURE TO BURNERS, °C				
44	AIR PRESSURE TO BURNERS, mm H ₂ O				
45	DRAUGHT LOSS, mm H ₂ O				
46	DESIGN				
47	NORMAL				
48	MINIMUM				
49	FUEL PRESSURE REQUIRED @ BURNERS, kgf/cm ² (ga)				
50	FLAME LENGTH @ DESIGN HEAT RELEASE, m				
51	FLAME SHAPE (ROUND, FLAT, ETC.)				
52	ATOMIZING MEDIUM / OIL RATIO, kg/kg				
53	NOTES:				
54					
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		DATA SHEET		Nº	Rev.	
		AREA:			SHEET	of
		TITLE:				
		BURNER				
1	GAS FUEL CHARACTERISTICS				REV.	
2	FUEL TYPE					
3	MASSIC HEAT VALUE (LHV), kcal/kg					
4	RELATIVE DENSITY (AIR = 1,0)					
5	MOLECULAR WEIGHT					
6	FUEL TEMPERATURE @ BURNER, °C					
7	FUEL PRESSURE AVAILABLE @ BURNER, kgf/cm² (ga)					
8	FUEL GAS COMPOSITION (MOLE %)					
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21	TOTAL					
22	LIQUID FUEL CHARACTERISTICS					
23	FUEL TYPE					
24	MASSIC HEAT VALUE (LHV), kcal/kg					
25	RELATIVE DENSITY (AT 15 °C)					
26	H/C RATIO (BY MASS)					
27	VISCOSITY, @ °C, SSU					
28	VISCOSITY, @ °C, SSU					
29	VANADIUM, mg/kg					
30	POTASSIUM, mg/kg					
31	SODIUM, mg/kg					
32	NICKEL, mg/kg					
33	FIXED NITROGEN, mg/kg					
34	SULFUR, MASS FRACTION (%)					
35	ASH, MASS FRACTION (%)					
36	WATER, MASS FRACTION (%)					
37	DISTILLATION: ASTM INITIAL BOILING POINT, °C					
38	ASTM MID-POINT, °C					
39	ASTM END-POINT, °C					
40	FUEL TEMPERATURE @ BURNER, °C					
41	FUEL PRESSURE AVAILABLE @ BURNER, kgf/cm² (ga)					
42	ATOMIZING MEDIUM: AIR/STEAM/MECHANICAL					
43	TEMPERATURE, °C					
44	PRESSURE, kgf/cm² (ga)					
45	NOTES:					
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