

Fire-Tube Boiler - 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.

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CONTEC

Comissão de Normalização
Técnica

SC - 22

Utility Equipment

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 04/2012) of PETROBRAS N-2250 REV. C 05/2011. 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 Data Sheet form to be used in Fire-Tube Boiler.

1.2 This Standard applies to projects started from the date of its issuance.

1.3 This Standard contains Technical Requirements and Recommended Practices.

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 amendments) applies.

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

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

NOTE 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 Conditions

3.1 The Data Sheet form of Annexes A and B is standardized in A4 format in 5 sheets, in accordance with Annex A of this Standard.

3.2 Data Sheet forms in Annexes A and B are in A4 format as per:


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


3.3 The Annex applicable to PETROBRAS [N-381](#) shall be used for continuation of any item exceeding Annex A of this Standard.


3.4 To fill the footer and legend of Data Sheet of Annexes A and B comply with PETROBRAS [N-381](#).

3.5 Identification of the fire-tube boiler shall comply with PETROBRAS [N-1521](#) and inserted into the field reserved for the name of the equipment (fire-tube boiler) on the right side.

[illegible]


	DATA SHEET		No.		REV.
			SHEET		of
	TITLE:				
FIRE-TUBE BOILER					
1 - BASIC CHARACTERISTICS					
1	SERVICE:	4	APPLICABLE: <input type="checkbox"/> PROPOSAL <input type="checkbox"/> PURCHASE <input type="checkbox"/> AS BUILT		
2	MANUFACTURER/MODEL:	5			
3	QUANTITY:	6			
2 - STEAM PRODUCED					
1	MAXIMUM CONTINUOUS OUTPUT (MPC):	t/h	9	EVAPORATION RATE: kg/m ²	
2	NORMAL PRESSURE (man.):	kgf/cm ²	10	THERMAL EFFICIENCY (PCI-BASED):	
3	PROJECT PRESSURE (man.):	kgf/cm ²	11	OPERATION: <input type="checkbox"/> CONTINUOUS <input type="checkbox"/>	
4	NORMAL TEMPERATURE:	°C	12	APPLICABLE STANDARDS:	
5	PROJECT TEMPERATURE:	°C	13	TEST STANDARD:	
6	STEAM PURITY - TOTAL SOLID:	ppm	14	AIR EMISSIONS CONTROL STANDARD:	
7	VAPOR - HUMIDITY:	%	15		
8	AUT. CONTROL RANGE FOR PRODUCTION:	a %	16		
3 - FEED WATER					
1	WATER PRESSURE BOILER INLET (man.):	kgf/cm ²	5	ANALYSIS AND PHYSICAL & CHEMICAL PROPERTIES OF WATER:	
2	WATER TEMP. BOILER INLET:	°C	6		
3	CONSUMPTION:	m ³ /h	7		
4	TYPE: <input type="checkbox"/> RAW <input type="checkbox"/> MILD <input type="checkbox"/> DE-AERATED		8		
4 - FUEL					
4.1 - FOR CONTINUOUS BURNING			4.2 - FOR START-UP		
1	TYPE:		1	TYPE:	
2	PCI:	kcal/kg	2	PCI:	
3	CONSUMPTION (A MPC):	kg/h	3	CONSUMPTION (A MPC):	
4	INLET PRESSURE OF BURNER (man.):	kgf/cm ²	4	INLET PRESSURE OF BURNER (Man.):	
5	INLET TEMP. AT BURNER:	°C	5	INLET TEMP. AT BURNER:	
6			6		
5 - ATOMIZING STEAM					
1	TEMPERATURE:	°C	4		
2	PRESSURE (man.):	kgf/cm ²	5		
3	CONSUMPTION:	kg/kg OF FUEL	6		
6 - PURGE					
1	FREQUENCY:		4	DIAMETER: mm	
2	QUICK DISCHARGE VALVE: <input type="checkbox"/> YES <input type="checkbox"/> NO		5		
3	MANUFACTURER:		6		
7 - ATOMIZING AIR (FOR START-UP)					
1	PRESSURE (man.):	kgf/cm ²	3		
2	CONSUMPTION:	Nm ³ /h	4		
8 - COMBUSTION AIR					
1	EXCESS OF AIR @ MPC:	%	4	AIR FLOW RATE @ MPC: Nm ³ /h	
2	AIR PRESSURE IN WIND BOX:	mmH ₂ O	5		
3	AIR TEMPERATURE IN WIND BOX:	°C	6		
9 - BURNER					
1	MANUFACTURER:		6	TURN-DOWN:	
2	TYPE AND/OR MODEL:		7	COMBUSTION CONTROL SYSTEM:	
3	ALLOWABLE NOISE LEVEL:	dB		<input type="checkbox"/> ON-OFF <input type="checkbox"/> 2-STAGE <input type="checkbox"/> MODULATING	
4	MAXIMUM CAPACITY:	kcal/h	8	PILOT: <input type="checkbox"/> YES <input type="checkbox"/> NO	
5	MINIMUM CAPACITY:	kcal/h	9		
10 - COMBUSTION GAS					
1	TEMP. AT FURNACE OUTLET:	°C	4	% CO ₂ : FOR OIL: FOR GAS:	
2	PRESSURE @ FURNACE OUTLET:	mmH ₂ O	5		
3	FLOW RATE @ MPC:	Nm ³ /h	6		
11 - STACK					
1	MATERIAL:		4	HEIGHT (ABOVE GROUND): m	
2	PLATE THICKNESS:	mm	5	SOOT COLLECTOR: <input type="checkbox"/> YES <input type="checkbox"/> NO	
3	INNER DIAMETER:	mm	6	MANUFACTURER/MODEL:	
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	DATA SHEET		No.	REV.
	TITLE:		SHEET of	
	FIRE-TUBE BOILER			
12 - SAFETY VALVES				
1	QUANTITY:	7	ACCUMULATION:	%
2	LOCATION:	8	MATERIALS - INTERNAL:	
3	MANUFACTURER:	9	MATERIALS - SPRING:	
4	TYPE AND/OR MODEL:	10	MATERIALS - BODY:	
5	ADJUSTMENT PRESSURE (man.):	kgf/cm ²	11	
6	MAX. FLOW RATE EACH VALVE:	kg/h	12	
13 - BUILT CHARACTERISTICS				
13.1 - GENERAL				
1	MAX. ALL. WORK PRESS. (MAWP) (man.):	kgf/cm ²	6	TOTAL WEIGHT EMPTY:
2	HYDROSTATIC PRESSURE TEST (man.):	kgf/cm ²	7	TOTAL WEIGHT FULL:
3	TOTAL SURFACE HEATING:	m ²	8	WATER VOLUME:
4	NUMBER OF GAS PASSAGES:		9	
5	OUTER DIMENSIONS:		10	
	TOTAL WIDTH:	mm	11	
	TOTAL LENGTH:	mm	12	
	TOTAL HEIGHT:	mm	13	
13.2 - SIDE				
1	INNER DIAMETER:	mm	4	MATERIAL:
2	PLATE THICKNESS:	mm	5	
3	THERMAL INSUL THICK.:	mm	6	
13.3 - FURNACE				
1	TYPE:		4	MATERIAL:
2	INNER DIAMETER:	mm	5	
3	PLATE THICKNESS:	mm	6	
13.4 - FURNACE MIRROR				
1	INNER DIAMETER:	mm	4	
2	THICKNESS:	mm	5	
3	MATERIAL:		6	
13.5 - BODY MIRRORS				
1	INNER DIAMETER:	mm	4	
2	THICKNESS:	mm	5	
3	MATERIAL:		6	
13.6 - GAS PIPES				
1	QUANTITY:		4	MATERIAL:
2	OUTER DIAMETER:	mm	5	
3	THICKNESS:	mm	6	
13.7 - BRACE PIPES				
1	THICKNESS:	mm	3	
2	MATERIAL:		4	
14 - MAIN AUXILIARY EQUIPMENT				
14.1 - FEED WATER PUMP				
1	QUANTITY:		11	IMPELLER DIAMETER - SELECTED:
2	MANUFACTURER/MODEL:		12	IMPELLER DIAMETER - MAXIMUM:
3	TYPE:		13	DRIVE: POWER: HP
4	RATED FLOW:	m ³ /h	14	BHP:
5	AMT - PROJECT:	m	15	MATERIAL - HOUSING:
6	AMT - MAX:	m	16	MATERIAL - IMPELLER:
7	DISCHARGE PRESSURE (man.):	kgf/cm ²	17	COOLING:
8	RPM:		18	
9	EFFICIENCY:	%	19	
10	NUMBER OF STAGES:		20	
14.2 - COMBUSTION AIR FAN				
1	MANUFACTURER/MODEL:		7	RPM:
2	TYPE:		8	REDUCER: <input type="checkbox"/> YES <input type="checkbox"/> NO
3	RATED FLOW:	Nm ³ /h	9	BHP:
4	DISCHARGE PRESSURE (man.):	kgf/m ²	10	
5	RPM:		11	
6	DRIVE: POWER:	HP	12	
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		DATA SHEET		No.	REV.
TITLE:				SHEET of	
FIRE-TUBE BOILER					
14.3 - MAIN FUEL OIL PUMP					
1	MANUFACTURER/MODEL:			7	REDUCER: <input type="checkbox"/> YES <input type="checkbox"/> NO
2	TYPE:			8	BHP:
3	RATED FLOW: kg/h			9	MATERIAL - HOUSING:
4	DISCHARGE PRESSURE: kgf/cm ²			10	MATERIAL - ROTOR:
5	DRIVE:	POWER: HP		11	
6	RPM:			12	
15 - TEST					
1	<input type="checkbox"/> HYDROSTATIC	<input type="checkbox"/> WITNESSED		8	PERFORMANCE TEST - STANDARD:
2	<input type="checkbox"/> PERFORMANCE	<input type="checkbox"/> WITNESSED		9	PERFORMANCE TEST - METHOD:
3	<input type="checkbox"/> MECHANICAL OPERATION	<input type="checkbox"/> WITNESSED		10	CONDITIONS OF REFERENCE FOR PERFORMANCE TEST:
4	<input type="checkbox"/> INSPECTION	<input type="checkbox"/> WITNESSED		11	PCI: kcal/kg
5	<input type="checkbox"/>	<input type="checkbox"/>		12	ROOM TEMPERATURE: °C
6	<input type="checkbox"/>	<input type="checkbox"/>		13	FEED WATER TEMP: °C
7	<input type="checkbox"/>	<input type="checkbox"/>		14	
16 - LOCAL AND INSTALLATION DATA					
1	ROOM TEMPERATURE - MINIMUM: °C			7	CLASSIFICATION OF ENVIRONMENT AS PER PETROBRAS N-
2	ROOM TEMPERATURE - MILD: °C			8	HAZARDOUS AREA: <input type="checkbox"/> YES <input type="checkbox"/> NO
3	ROOM TEMPERATURE - MAX: °C			9	CLASS: GROUP: DIVISION:
4	RELATIVE HUMIDITY: %			10	
5	ALTITUDE ABOVE SEA LEVEL: m			11	
6	INSTALLATION: <input type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR			12	
17 - CONSUMPTION OF UTILITIES (PER BOILER IN OPERATION)					
ELECTRICITY					
1	FEED WATER PUMP: kW			10	COOLING WATER: m ³ /h
2	FAN: kW			11	INSTRUMENT AIR: Nm ³ /h
3	AIR COMPRESSOR: kW			12	STEAM FOR HEATERS: kg/h
4	BURNER MOTOR: kW			13	
5	MAIN OIL PUMP: kW			14	
6	DIESEL OIL PUMP: kW			15	
7	RESISTANCE OIL HEATER (START-UP): kW			16	
8	CONTROL/COMMAND: kW			17	
9	RESISTANCE DAY TANK: kW			18	
18 - UTILITIES AVAILABLE					
18.1 - FUEL					
VOLUME %		OIL	GAS		
1	H ₂			19	VANADIUM (ppm)
2	C			20	SODIUM (ppm)
3	O ₂			21	NICKEL (ppm)
4	N ₂			22	* API
5	S			23	VISCOSITY
6	H ₂ S			24	KINEMATIC (cSt)
7	CO ₂			25	DENSITY
8	CO			26	MOLECULAR WEIGHT
9	C1			27	
10	C2			28	
11	C3			29	
12	IC4			30	
13	nC4			31	
14	IC5			32	
15	nC5			33	
16	C6			34	
17				35	
18					
18.2 - COMPRESSED INSTRUMENT AIR					
1	PRESSURE (man.): kgf/cm ²			3	DEW POINT (e): °C
2	TEMPERATURE: °C			4	
18.3 - COOLING WATER					
1	PRESSURE (man.): kgf/cm ²			3	QUALITY (TYPE):
2	TEMPERATURE: °C			4	


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FORM OWNED TO PETROBRAS N-2250 REV. C ANNEX A - SHEET 04/05.


	DATA SHEET				No.		REV.		
	TITLE: FIRE-TUBE BOILER						SHEET		of
18.4 - ELECTRICITY									
1	ENGINE:	V	Hz	Ø	5	CONTROL:	V	Hz	Ø
2		V	Hz	Ø	6	PANEL:	V	Hz	Ø
3		V	Hz	Ø	7				
4	HEATERS:	V	Hz	Ø	8				
19 - NOTES									
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 PETROBRAS	DATA SHEET		No.						
	CLIENT:			SHEET	of				
	PROGRAM:								
	AREA:								
	TITLE:			FIRE-TUBE BOILER					
INDEX OF REVISIONS									
REV.	DESCRIPTION AND/OR SHEETS AFFECTED								
	REV. 0	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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FORM OWNED TO PETROBRAS N-2250 REV. C ANNEX B - SHEET 01/05.									

		DATA SHEET		No.	REV.
TITLE:				SHEET of	
FIRE-TUBE BOILER					
1 - BASIC CHARACTERISTICS					
1	SERVICE:	4	APPLICABLE: <input type="checkbox"/> PROPOSAL <input type="checkbox"/> PURCHASE <input type="checkbox"/> AS BUILT		
2	MANUFACTURER/MODEL:	5			
3	QUANTITY:	6			
2 - STEAM PRODUCED					
1	MAXIMUM CONTINUOUS OUTPUT (MPC):	kg/h	9	EVAPORATION RATE:	kg/m ²
2	NORMAL PRESSURE (man.):	MPa	10	THermal EFFICIENCY (PCI-BASED):	
3	PROJECT PRESSURE (man.):	MPa	11	OPERATION: <input type="checkbox"/> CONTINUOUS <input type="checkbox"/>	
4	NORMAL TEMPERATURE:	°C	12	APPLICABLE STANDARDS:	
5	PROJECT TEMPERATURE:	°C	13	TEST STANDARD:	
6	STEAM PURITY - TOTAL SOLID:	ppm	14	AIR EMISSIONS CONTROL STANDARD:	
7	VAPOR - HUMIDITY	%	15		
8	AUT. CONTROL RANGE FOR PRODUCTION:	a	%	16	
3 - FEED WATER					
1	WATER PRESSURE BOILER INLET (man.):	MPa	5	ANALYSIS AND PHYSICAL & CHEMICAL PROPERTIES OF WATER:	
2	WATER TEMP. BOILER INLET:	°C	6		
3	CONSUMPTION:	m ³ /h	7		
4	TYPE: <input type="checkbox"/> RAW <input type="checkbox"/> MILD <input type="checkbox"/> DE-AERATED <input type="checkbox"/>		8		
4 - FUEL					
4.1 - FOR CONTINUOUS BURNING			4.2 - FOR START-UP		
1	TYPE:		1	TYPE:	
2	PCI:	kJ/kg	2	PCI:	kJ/kg
3	CONSUMPTION (A MPC):	kg/h	3	CONSUMPTION (A MPC):	kg/h
4	INLET PRESSURE OF BURNER (man.):	MPa	4	INLET PRESSURE OF BURNER (man.):	MPa
5	INLET TEMPERATURE OF BURNER (man.):	°C	5	INLET TEMPERATURE OF BURNER (man.):	°C
6			6		
5 - ATOMIZING STEAM					
1	TEMPERATURE:	°C	4		
2	PRESSURE (man.):	MPa	5		
3	CONSUMPTION:	kg/kg OF FUEL	6		
6 - PURGE					
1	FREQUENCY:		4	DIAMETER:	mm
2	QUICK DISCHARGE VALVE: <input type="checkbox"/> YES <input type="checkbox"/> NO		5		
3	MANUFACTURER:		6		
7 - ATOMIZING AIR (FOR START-UP)					
1	PRESSURE (man.):	MPa	3		
2	CONSUMPTION:	Nm ³ /h	4		
8 - COMBUSTION AIR					
1	EXCESS OF AIR @ MPC:	%	4	FLOW RATE @ MPC:	Nm ³ /h
2	AIR PRESSURE IN WIND BOX:	Pa	5		
3	AIR TEMPERATURE IN WIND BOX:	°C	6		
9 - BURNER					
1	MANUFACTURER:		6	TURN-DOWN:	
2	TYPE AND/OR MODEL:		7	COMBUSTION CONTROL SYSTEM:	
3	ALLOWABLE NOISE LEVEL:	dB		<input type="checkbox"/> ON-OFF <input type="checkbox"/> 2-STAGE <input type="checkbox"/> MODULATING	
4	MAXIMUM CAPACITY:	kW	8	PILOT: <input type="checkbox"/> YES <input type="checkbox"/> NO	
5	MINIMUM CAPACITY:	kW	9		
10 - COMBUSTION GAS					
1	FEED FURNACE OUTLET:	°C	4	% CO ₂ FOR OIL:	FOR GAS:
2	PRESSURE @ FURNACE OUTLET:	Pa	5		
3	FLOW RATE @ MPC:	Nm ³ /h	6		
11 - STACK					
1	MATERIAL:		4	HEIGHT (ABOVE GROUND):	m
2	PLATE THICKNESS:	mm	5	SOOT COLLECTOR: <input type="checkbox"/> YES <input type="checkbox"/> NO	
3	INNER DIAMETER:	mm	6	MANUFACTURER/MODEL:	
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FORM OWNED TO PETROBRAS N-2250 REV. C ANNEX B - SHEET 02/05.					

		DATA SHEET		No.	REV.
		TITLE:		SHEET	of
FIRE-TUBE BOILER					
12 - SAFETY VALVES					
1	QUANTITY:	7	ACCUMULATION:	%	
2	LOCATION:	8	MATERIALS - INTERNAL:		
3	MANUFACTURER:	9	MATERIALS - SPRING:		
4	TYPE AND/OR MODEL:	10	MATERIALS - BODY:		
5	ADJUSTMENT PRESSURE (man.):	MPa	11		
6	MAX. FLOW RATE EACH VALVE:	kg/h	12		
13 - BUILT CHARACTERISTICS					
13.1 - GENERAL					
1	MAX. ALL. WORK PRESS. (MAWP) (man):	MPa	6	TOTAL WEIGHT EMPTY:	kg
2	HYDROSTATIC PRESSURE TEST (man.):	MPa	7	TOTAL WEIGHT FULL:	kg
3	TOTAL SURFACE HEATING:	m ²	8	WATER VOLUME:	m ³
4	NUMBER OF GAS PASSAGES:		9		
5	OUTER DIMENSIONS:		10		
	TOTAL WIDTH:	mm	11		
	TOTAL LENGTH:	mm	12		
	TOTAL HEIGHT:	mm	13		
13.2 - SIDE					
1	INNER DIAMETER:	mm	4	MATERIAL:	
2	PLATE THICKNESS:	mm	5		
3	THERMAL INSUL THICK.:	mm	6		
13.3 - FURNACE					
1	TYPE:		4	MATERIAL:	
2	INNER DIAMETER:	mm	5		
3	PLATE THICKNESS:	mm	6		
13.4 - FURNACE MIRROR					
1	INNER DIAMETER:	mm	4		
2	THICKNESS:	mm	5		
3	MATERIAL:		6		
13.5 - BODY MIRRORS					
1	INNER DIAMETER:	mm	4		
2	THICKNESS:	mm	5		
3	MATERIAL:		6		
13.6 - GAS PIPES					
1	QUANTITY:		4	MATERIAL:	
2	OUTER DIAMETER:	mm	5		
3	THICKNESS:	mm	6		
13.7 - BRACE PIPES					
1	THICKNESS:	mm	3		
2	MATERIAL:		4		
14 - MAIN AUXILIARY EQUIPMENT					
14.1 - FEED WATER PUMP					
1	QUANTITY:		11	IMPELLER DIAMETER - SELECTED:	mm
2	MANUFACTURER/MODEL:		12	IMPELLER DIAMETER - MAXIMUM:	mm
3	TYPE:		13	DRIVE:	POWER:
4	RATED FLOW:	m ³ /h	14	bkW:	
5	AMT - PROJECT:	m	15	MATERIAL - HOUSING:	
6	AMT - MAX:	m	16	MATERIAL - IMPELLER:	
7	DISCHARGE PRESSURE (Man.):	MPa	17	COOLING:	m ³ /h
8	RPM:		18		
9	EFFICIENCY:	%	19		
10	NUMBER OF STAGES:		20		
14.2 - COMBUSTION AIR FAN					
1	MANUFACTURER/MODEL:		7	RPM:	
2	TYPE:		8	REDUCER:	<input type="checkbox"/> YES <input type="checkbox"/> NO
3	RATED FLOW:	Nm ³ /h	9	BHP:	
4	DISCHARGE PRESSURE (man.):	MPa	10		
5	RPM:		11		
6	DRIVE:	POWER:	12		
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		DATA SHEET		No.	REV.
		TITLE:			SHEET
FIRE-TUBE BOILER					
14.3 - MAIN FUEL OIL PUMP					
1	MANUFACTURER/MODEL:			7	REDUCER: <input type="checkbox"/> YES <input type="checkbox"/> NO
2	TYPE:			8	BHP:
3	RATED FLOW: Nm ³ /h			9	MATERIAL - HOUSING:
4	DISCHARGE PRESSURE: MPa			10	MATERIAL - ROTOR:
5	DRIVE:		POWER: kW	11	
6	RPM:			12	
15 - TEST					
1	<input type="checkbox"/> HYDROSTATIC		<input type="checkbox"/> WITNESSED	8	PERFORMANCE TEST - STANDARD:
2	<input type="checkbox"/> PERFORMANCE		<input type="checkbox"/> WITNESSED	9	PERFORMANCE TEST - METHOD:
3	<input type="checkbox"/> MECHANICAL OPERATION		<input type="checkbox"/> WITNESSED	10	CONDITIONS OF REFERENCE FOR PERFORMANCE TEST:
4	<input type="checkbox"/> INSPECTION		<input type="checkbox"/> WITNESSED	11	PCI: kJ/kg
5	<input type="checkbox"/>		<input type="checkbox"/>	12	ROOM TEMPERATURE: °C
6	<input type="checkbox"/>		<input type="checkbox"/>	13	FEED WATER TEMP: °C
7	<input type="checkbox"/>		<input type="checkbox"/>	14	
16 - LOCAL AND INSTALLATION DATA					
1	ROOM TEMPERATURE - MINIMUM: °C			7	CLASSIFICATION OF ENVIRONMENT AS PER PETROBRAS N-
2	ROOM TEMPERATURE - MILD: °C			8	HAZARDOUS AREA: <input type="checkbox"/> YES <input type="checkbox"/> NO
3	ROOM TEMPERATURE - MAX: °C			9	CLASS: GROUP: DIVISION:
4	RELATIVE HUMIDITY: %			10	
5	ALTITUDE ABOVE SEA LEVEL: m			11	
6	INSTALLATION: <input type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR			12	
17 - CONSUMPTION OF UTILITIES (PER BOILER IN OPERATION)					
ELECTRICITY					
1	FEED WATER PUMP: kW			10	COOLING WATER: m ³ /h
2	FAN: kW			11	INSTRUMENT AIR: Nm ³ /h
3	AIR COMPRESSOR: kW			12	STEAM FOR HEATERS: kg/h
4	BURNER MOTOR: kW			13	
5	MAIN OIL PUMP: kW			14	
6	DIESEL OIL PUMP: kW			15	
7	RESISTANCE OIL HEATER (START-UP): kW			16	
8	CONTROL/COMMAND: kW			17	
9	RESISTANCE DAY TANK: kW			18	
18 - UTILITIES AVAILABLE					
18.1 - FUEL					
VOLUME%		OIL	GAS		
1	H ₂			19	VANADIUM (ppm)
2	C			20	SODIUM (ppm)
3	O ₂			21	NICKEL (ppm)
4	N ₂			22	* API
5	S			23	VISCOSITY
6	H ₂ S			24	KINEMATIC (Pa.s)
7	CO ₂			25	DENSITY
8	CO			26	MOLECULAR WEIGHT
9	C1			27	
10	C2			28	
11	C3			29	
12	IC4			30	
13	nC4			31	
14	IC5			32	
15	nC5			33	
16	C6			34	
17				35	
18					
18.2 - COMPRESSED INSTRUMENT AIR					
1	PRESSURE (man.): MPa			3	DEW POINT (e): °C
2	TEMPERATURE: °C			4	
18.3 - COOLING WATER					
1	PRESSURE (man.): MPa			3	QUALITY (TYPE):
2	TEMPERATURE: °C			4	
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FORM OWNED TO PETROBRAS N-2250 REV. C ANNEX B - SHEET 04/05.					

 PETROBRAS	DATA SHEET				No.		REV.			
	TITLE: FIRE-TUBE BOILER						SHEET		of	
18.4 - ELECTRICITY										
1	ENGINE:	V	Hz	⊗	5	CONTROL:	V	Hz	⊗	
2		V	Hz	⊗	6	PANEL:	V	Hz	⊗	
3		V	Hz	⊗	7					
4	HEATERS:	V	Hz	⊗	8					
19 - NOTES										
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