



GS 114-6

HVAC - COOLING COILS FOR OFFSHORE USE

August 1993

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SCOPE AND PURPOSE This document specifies the general requirements for the design and construction of HVAC Cooling Coils for use offshore. Its purpose is for the specification of fit-for-purpose HVAC Cooling Coils at minimum cost.											
AMENDMENTS <table border="0" style="width: 100%;"> <tr> <td style="width: 15%;">Amd</td> <td style="width: 25%;">Date</td> <td style="width: 25%;">Page(s)</td> <td style="width: 35%;">Description</td> </tr> <tr> <td colspan="4"> </td> </tr> </table>				Amd	Date	Page(s)	Description				
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FOREWORD

Introduction to BP Group Recommended Practices and Specifications for Engineering

The Introductory Volume contains a series of documents that provide an introduction to the BP Group Recommended Practices and Specifications for Engineering (RPSEs). In particular, the 'General Foreword' sets out the philosophy of the RPSEs. Other documents in the Introductory Volume provide general guidance on using the RPSEs and background information to Engineering Standards in BP. There are also recommendations for specific definitions and requirements.

Value of this Guidance for Specification

This Guidance for Specification was developed under the BP Exploration XEU Simple Specifications Initiative. This initiative is intended to simplify the purchasing requirements through a minimum conditions of satisfaction approach in regions where there is a mature supplier resource.

Application

This Guidance for Specification is intended to guide the purchaser in the use or creation of a fit-for-purpose specification for enquiry or purchasing activity.

Text in *italics* is Commentary. Commentary provides background information which supports the requirements of the Specification, and may discuss alternative options.

This document may refer to certain local, national or international regulations but the responsible to ensure compliance with legislation and any other statutory requirements lies with the user. The user should adapt or supplement this document to ensure compliance for the specific application.

Specification Ready for Application

A Specification (BP Spec 114-6) is available which may be suitable for enquiry or purchasing without modification. It is derived from this BP Group Guidance for Specification by retaining the technical body unaltered but omitting all commentary, omitting the data page and inserting a modified Foreword.

Feedback and Further Information

Users are invited to feed back any comments and to detail experiences in the application of BP RPSE's to assist in the process of their continuous improvement.

For feedback and further information, please contact Standards Group, BP International or the Custodian. See Quarterly Status List for contacts.



1. INTRODUCTION

1.1 Scope

This document specifies the requirements for Cooling Coils for use on hydrocarbon production, processing and export facilities offshore.

The Vendor's scope shall include the following:-

Cooling Coils complete with casing, flanges and runners (when installed in air handling units).

Provision of Documentation:-

- (a) General Arrangements.
- (b) Schedule.

1.2 Quality Assurance

Verification of the vendor's quality system is normally part of the pre-qualification procedure, and is therefore not specified in the core text of this specification. If this is not the case, clauses should be inserted to require the vendor to operate and be prepared to demonstrate the quality system to the purchaser. The quality system should ensure that the technical and QA requirements specified in the enquiry and purchase documents are applied to all materials, equipment and services provided by sub-contractors and to any free issue materials.

Further suggestions may be found in the BP Group RPSEs Introductory Volume

2. GENERAL

2.1 Documentation

- 2.1.1 This Specification shall be read in conjunction with an enquiry or purchase order and the accompanying data sheets.

2.2 Exceptions

- 2.2.1 Tenders for the supply of Cooling Coils shall include either an unqualified affirmation regarding compliance with the specification or a complete list of detailed exceptions.
- 2.2.2 A Vendor may offer alternative suitable proposals where price, delivery or technical advantage may accrue, but such proposals shall be in addition to the main bid/tender.

2.3 Conflicts

- 2.3.1 If any of the reference documents conflict, and definition is not established by the provisions of Section 3 of this Specification, then the



Vendor or his sub-supplier shall bring this to the attention of the Purchaser.

3. STANDARD DESIGN REQUIREMENTS

3.1 Design

3.1.1 The cooling coils shall be suitable for mounting within ductwork or inside air handling unit casings as indicated on the Data Sheets.

3.1.2 The cooling coil shall be suitable for a maximum system static pressure of 1500 Pa.

3.1.3 Moisture eliminators shall be provided with each cooling coil.

Whilst the Vendors will state that 2.5 m/s face velocity eliminators are not required, experience has shown that water droplets have formed and caused down stream internal corrosion. The provision of eliminators will have a minimal cost and size impact on the unit.

3.1.4 The maximum face velocity shall be 2.5 m/s with a tubeside cooling water velocity between 0.9 to 1.5 m/s.

Operations must adhere to this water velocity if the internal erosion of the pipework is to be prevented.

3.1.5 External conditions are:

Summer	20°C db	18°C wb
Winter	-6°C db	-6°C wb

Seawater temperatures are shown on the Data Sheets; a 1°C temperature rise from pumps should be allowed for in the design.

3.1.7 The cooling coils shall be designed to incorporate the fouling factor, indicated on the Data Sheets, without compromising performance.

3.1.8 The seawater will be filtered down to 120 micron and dosed with hypochlorite.

3.2 General Construction

3.2.1 The header box tube plates shall be 25 mm thick, the cover plates shall be 20 mm thick with the header grids varying from 6 mm to 19 mm. The above shall be manufactured from CuNi 90/10 to [BS 2875](#).

Easy maintenance for cleaning and removal of tubes.



- 3.2.2 The header grid boxes shall contain baffles to determine the number of water flow passes per cooler.
- 3.2.3 The secondary tubes shall be manufactured from solid drawn seamless cupro-nickel tube to [BS 2871](#) Part 3. They shall be expanded a minimum of 0.6 mm into fin collars. All secondary tubes shall have a minimum wall thickness of 0.8 mm.
- 3.2.4 The whole block shall be electro-tinned after manufacture to [BS 1872](#) with a tin thickness of not less than 30 microns.
- Using electro-tinning provides better corrosion resistance.*
- 3.2.5 CuNi 70/30 may be offered as an alternative material provided it meets the design life identified on the Data Sheets.
- 3.2.6 Fins shall be 0.25 mm thick copper strip to [BS 2870](#) and electro-tinned after manufacture as part of the fin block.
- 3.2.7 The coil shall be housed in 3 mm mild steel to [BS 1449](#) Part 1, hot dipped galvanised after manufacture to BS 729 Table 1, or 3 mm stainless steel to [BS 1449](#) Part 2 type 316.
- 3.2.8 Header boxes shall be located out of the air stream.
- 3.2.9 Each coil shall consist of a drain cock, air vent and drip tray.
- 3.2.10 All cooling coils shall have the Vendors standard nameplate containing the following information:-
- Project Name
PO Number
Vendors serial number
Year of manufacture
Tag number
Air Volume m³/s
Duty kW
Seawater flow rate kg/s
Air Pressure Drop Pa
Water Pressure Drop kPa
Air flow direction arrow
Weight dry kg
Weight operating Kg
- 3.2.11 Each cooling coil shall have lifting lugs or eyes provided on the assembly.



DEFINITIONS AND ABBREVIATIONS

Definitions

Standardised definitions may be found in the BP Group RPSEs Introductory Volume.

Abbreviations

BS	British Standard
CuNi	Cupro Nickel



LIST OF REFERENCED DOCUMENTS

A reference invokes the latest published issue or amendment unless stated otherwise.

Referenced standards may be replaced by equivalent standards that are internationally or otherwise recognised provided that it can be shown to the satisfaction of the purchaser's professional engineer that they meet or exceed the requirements of the referenced standards.

British Standards

BS 1224	Electroplated Coatings of Nickel and Chromium.
BS 1449	Steel Plate, sheet and strip Part 1 and Part 2.
BS 1872	Specification for electroplated coatings of tin.
BS 2870	Specification for rolled copper and copper alloys sheet, strip and foil.
BS 2871	Copper and copper alloys. Part 3: Tubes for heat exchangers.
BS 2875	Specification for copper and copper alloys. Plate.



DATA SHEET

SPS-X-XX-XX-HV-0007

Cooling Coils

PROJECT		MODULE/AREA/LOCATION		DOC REF No.		
CONTRACTOR		FLOW DRG No.				REV
SYSTEM AND SERVICE		LAYOUT DRG No.				REV
EQUIPMENT TAG NO.						REV
TECHNICAL DETAILS		UNITS	DESIGN		VENDOR	
1	Air Volume	m ³ /s				
2	Face Velocity	m/s m				
3	Inlet Water Temperature	C				
4	Outlet Water Temperature	C				
5	Pressure Drop Water	Kpa				
6	Pressure Drop Air	Pa				
7	Working Pressure	barg				
8	Operating Pressure	barg				
9	Air Temperature on Coil	C	db	wb		
10	Air Temperature off Coil	C	db	wb		
11	Pipework Connection Size	mm				
12	Size of Coil	mm				
13	Depth of Coil	mm				
14	Weight Dry	Kg				
15	Weight Operating	Kg				
16	MATERIALS CONSTRUCTION				VENDOR	
17	Casing	-				
18	Tube	-				
19	Headers	-				
20	Fin Thickness	mm				
21	Thickness of Tinning	mm				
22	Casing Thickness	mm				
23	Flanges Details	-				
24	Size of Vent	mm				
26	Size of Drain	mm				
26	PIPEWORK CONNECTIONS					

VIEWED IN DIRECTION OF AIRFLOW

