

# Quick Reference Guide

*EUROPEAN PRESSURE EQUIPMENT DIRECTIVE (PED)  
97/23/EC*

***PED SELECTION GUIDE***

# Introduction

This **QUICK REFERENCE GUIDE** is intended as an introduction and an aid to understanding the European Pressure Equipment Directive (PED) (97/23/EC). It describes certain requirements of the Directive in general terms and is not intended as a replacement for the PED. Manufacturers should refer to the Directive and consult their Notified Body for authoritative guidance.

## MEMBER STATES OF THE EUROPEAN COMMUNITY (EC)

Austria	Germany	The Netherlands
Belgium	Greece	Poland
Bulgaria	Hungary	Portugal
Cyprus	Ireland	Romania
Czech Republic	Italy	Slovakia
Denmark	Latvia	Slovenia
Estonia	Lithuania	Spain
Finland	Luxembourg	Sweden
France	Malta	United Kingdom

European Economic Area (EEA): Norway, Liechtenstein

Associated Countries: Switzerland

Candidate Countries: Croatia, Turkey

## DEFINITIONS

- DN – Nominal size. A numerical designation (unitless, but related to mm), generally for piping and pressure accessories.
- EN – European Standard
- Material – Main pressure-bearing material (Annex I, Section 4.3)
- MTR – Material Test Report
- NoBo – Notified Body appointed by a Member State to carry out the duties referred to in Annex III of the PED, including review of final assessment. (See also Article 12 and Annex IV)
- PMA – Particular Material Appraisal
- PS (bar) – Maximum allowable pressure for which equipment is designed, as specified by the Manufacturer.
- SEP (Sound Engineering Practice) – Equipment under SEP needs to be accompanied by adequate instruction for use, and bear identification markings of the Manufacturer or representative in the EC. The CE Marking must NOT be affixed.
- RTPO – Recognized Third-Party Organization appointed by an EC Member State to carry out approvals of permanent joining personnel and procedures for Categories II, III and IV, and NDT (NDE) personnel for Categories III and IV (Article 13).
- User Inspectorate – Applies only for users located in the European Community (Article 14).
- V (liters) – Volume for vessels or other equipment.

## EXPLANATION

Assemblies, which include at least one item of pressure equipment classed in Categories I through IV, must meet Essential Safety Requirements (Annex I). Article 3, Section 2.3 details special requirements for assemblies generating steam or superheated water greater than or equal to 110°C and manually fed with solid fuel with PS x V exceeding 50 bar-liters.

The PED covers the design, manufacture and conformity assessment of pressure equipment and assemblies of pressure equipment with a maximum allowable pressure greater than 0.5 bar (7.25 psig) gauge. Scope, definitions and exemptions are covered in Article I, Section 1 of the PED.

Manufactures may choose any Module (Conformity Assessment Procedure) listed for the given Category.

Manufacturers may choose to apply a higher Module than that resulting from the table in Annex II.

The Manufacturer is obligated to analyze the hazards of the pressure equipment in order to identify those which apply to its equipment on account of pressure; the manufacturer must then design and construct the pressure equipment taking into account these hazards.

## NOTIFIED BODY/THIRD-PARTY ORGANIZATIONS

As of April 2000, Notified Bodies and Third-Party Organizations have generally accepted the following standards for use in compliance with Essential Safety Requirements of the PED. As an example, please find the following harmonized standards:

EN ISO 15614 —	Specification and Qualification of Welding Procedures for Metallic Materials
EN 287 —	Qualification Test of Welders
EN 473 —	Non-Destructive Testing – Qualification and Certification of NDT Personnel
EN 13445 —	Unfixed Pressure Vessels

A current listing of PED harmonized standards is available at [www.newapproach.org](http://www.newapproach.org)

The use of Harmonized European Standards (EN) is not mandatory. However, pressure equipment manufactured using harmonized standards is presumed to comply with the Essential Safety Requirements of the PED. Harmonized Standards will be published in the *Official Journal of the European Union*, available at <http://eur-lex.europa.eu>

HSB Global Standards is recognized as an Authorized Inspection Agency under the name The Hartford Steam Boiler Inspection and Insurance Company of Connecticut and as a Notified Body under the name Hartford Steam Boiler International GmbH.

## Notified Body/Third-Party (RTPO) Organization Involvement Requirements

Category	NoBo or RTPO Approval of Permanent Joining Procedures	NoBo or RTPO Approval of Permanent Joining Personnel	NoBo or RTPO Approval of NDE Personnel	Material Requires a Certification of Specific Product Control (MTR)	PMA Reviewed and Accepted by Notified Body
SEP	No	No	No	No	No
I	No	No	No	No	No
II	Yes	Yes	No	Yes	No
III	Yes	Yes	Yes	Yes	Yes
IV	Yes	Yes	Yes	Yes	Yes

## REQUIRED MARKINGS [PER ANNEX VI AND ANNEX I, SECTION 3.3]

- a. For All Pressure Equipment
  - Notified Body Identification Number, where required per Annex III
  - Manufacturer's Name and Address
  - Year of Manufacture
  - Identification / Serial Number
  - Essential Maximum & Minimum Allowable Limits (bar, °C)
- b. Additional Requirements, When Applicable
  - Volume (liters) or Nominal Size (DN)
  - And, "as appropriate" per Annex I, Section 3.3 (b):
    - Pressure Test (bar) and Date
    - Safety Device Set Pressure (bar)
    - Output (kW)
    - Supply Voltage (volts)
    - Intended Use
    - Filling Ratio (kg/L)
    - Maximum Filling Mass (kg)
    - Tare Mass (kg)
    - Product Group
    - Warnings to Draw Attention to Misuse [Annex I, Section 3.3 (c)]

## CE MARK GUIDELINES

Required marking must be on the equipment or on a data-plate firmly attached to it. See Annex I, Section 3.3 (c) for exceptions. Markings must:

- Have a minimum vertical height of 5mm (~7/32").
- Maintain proper proportion regardless of size.
- Be visible, legible and indelible.
- Include the identification number of the Notified Body involved in the production control phase for pressure equipment in Category II, III and IV. Markings required by other codes are in addition to those of the PED and are to follow the requirements of those codes. Such markings must not interfere or cause confusion with the PED required markings.

The Declaration of Conformity (Annex VIII) is drawn up by the Manufacturer after applying the CE mark.

Member States may request that the marking, labeling information and operating instructions be provided in the official language(s) of the Member State in which the equipment will be used.

## ADDITIONAL REFERENCES

Allowable Stress	Annex I, Section 7.1
Assembly	Article 1, Section 2.1.5
Conformity Assessment	Annex II, Annex III, Article 10
Declaration of Conformity	Annex VII
Design	Annex I, Section 2
Documents and Document Retention	Annex III – See appropriate "Module"
Gas	Article 3, Section 1.1.(a), 1.3 (a)
Group 1	Article 9, Section 2.1 "dangerous"
Group 2	Article 9, Section 2.2 "not dangerous"
Joint Coefficients	Annex I, Section 7.2
Liquid	Article 3, Section 1.1.(b), 1.3 (b)
Marking	Annex I, Section 3.3, Annex VI and Article 15
Materials	Annex I, Section 4 and Annex I, Section 7.5

Nondestructive Testing (NDT)	Annex I, Section 3.1.3
Operating Instructions	Annex I, Section 3.4
Piping	Article 1, Section 2.1.2
Pressure Accessory	Article 1, Section 2.1.4
Pressure Limiting Devices	Annex I, Section 7.3
Proof (Hydro) Test	Annex I, Section 7.4 and Annex I, Section 3.2.2
Materials for Pressurized Parts	Annex I, Section 4.1
Safety Accessory	Article 1, Section 2.1.3
SEP (Sound Engineering Practice)	Article 3, Section 3
Steam Generator <sup>1</sup>	Article 3, Section 1.2
Vessel	Article 1, Section 2.1.2
Welding (Permanent Joining)	Annex I, Section 3.1.2

<sup>1</sup> Errata – Article 3, Section 1.2 and 2.1, 100°C should be 110°C

## CONFORMITY ASSESSMENT CROSS-REFERENCE TABLE

MODULE	TITLE	APPLICABLE CATEGORY	CE MARKING?	NOTIFIED BODY INVOLVMENT
N/A	Sound Engineering Practice	SEP	No	No
A	Internal Production Control	I	Yes, without Notified Body Number	No
A1	Internal Production Control with Monitoring of Final Assessment	II	Yes	Yes
B must be combined with C1, D, E or F	EC Type-Examination	III, IV	Yes	Yes – ascertains and attests that a representative example of production meets PED
B1* *See Note	EC Design-Examination	I, II (Table 4) and III	Yes*	Yes – ascertains and attests that design meets PED
C1 must be combined with B	Monitoring of Final Assessment	III	Yes	Yes
D must be combined with B or B1	Quality Assurance (QA) for Production, Final Inspection and Testing	III, IV	Yes	Yes
D1	QA for Production, Final Inspection and Testing	II	Yes	Yes
E must be combined with B	QA for Final Inspection and Testing	III	Yes	Yes
E1	QA for Final Inspection and Testing	II	Yes	Yes
F must be combined with B or B1	Product Verification	III, IV	Yes	Yes – with Certificate of Conformity
G	Unit Verification	IV	Yes	Yes – with Certificate of Conformity
H	Full QA	III	Yes	Yes
H1	Full QA with Design Examination and Monitoring of Final Assessment	IV	Yes	Yes

NOTE: For items built to Article 3, Section 2.3 – Module B1 may stand alone without Notified Body involvement in the production phase. CE Marking would be without Notified Body identification number in this case. For all other applications, Module B1 is combined with Modules D or F (Category III).

# Directions

## INTRODUCTION

The purpose of this PED Selection Guide is to aid the manufacturer in determining the Hazard Category for the pressure equipment, selecting the Conformity Assessment Module and provide additional information for cost estimate. Please refer to Directive 97/23/EC, European Pressure Equipment Directive (PED) for actual requirements.

## HOW TO USE THIS GUIDE

Follow the steps in the PED Selection Guide for each piece of Pressure Equipment and/or different design that will be CE marked in accordance with the PED.

**Step One** – Define Equipment Type

**Step Two** – Determine Gas or Liquid

**Step Three** – Choose Fluid Group

**Step Four** – Select Table

**Step Five** – From Table determine Category

**Step Six** – From Category determine Module

### Step One – Define Equipment Type

Vessel • Steam Generator • Piping

**Vessel** – A housing designed and built to contain fluids under pressure including its direct attachments up to the coupling point connecting it to other equipment. A vessel may be composed of more than one chamber.

**Steam Generator or Pressure Cookers or Otherwise Heated Pressure Equipment** – Fired or otherwise heated pressure equipment intended for generation of steam or super-heated water at temperatures higher than 110°C having a volume greater than 2 liters and all pressure cookers.

**Piping** – Piping components for the transport of fluids, when connected together for integration into a pressure system. Piping includes in particular a pipe or system of pipes, tubing, fittings, expansion joints, hoses, or other pressure-bearing components as appropriate. Heat exchangers consisting of pipes for the purpose of cooling or heating air shall be considered as piping.

### Step Two – Determine Gas or Liquid\*

\*If vapor pressure of liquid is at maximum allowable temperature is greater than 0.5 bar above normal atmospheric pressure, treat as a GAS (Article 3.1.1 and 1.3). If a vessel or chamber contains more than one fluid, base the classification on the fluid state that requires the higher hazard category.

### Step Three – Choose the Fluid Group (Article 9 of PED)

**Group 1** – Fluids defined as: explosive, extremely flammable, highly flammable, flammable (where the maximum allowable temperature is above flashpoint), very toxic, toxic, or oxidizing.

**Group 2** – All fluids not referred to in Group 1.

*Refer to directive 67/548/EEC and MSDS (Material Safety Data Sheet) for additional guidance.*

### Step Four – Select Table

Select table as indicated in the flow chart.

### Step Five – Select Hazard Category from Table

To find Hazard Category, use the pressure, volume, diameter, and/or product values defined in Equipment Type. The demarcation lines in the tables indicate the upper limit for each category.

### Step Six – From Category determine Module

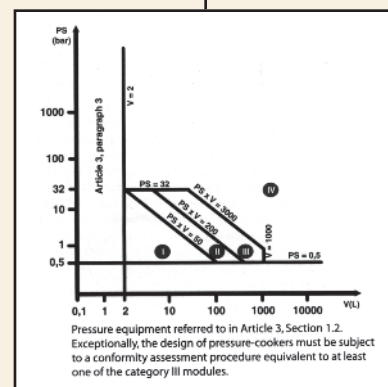


## Steam Generator

Design Pressure (Bar): \_\_\_\_\_

Volume (Liters): \_\_\_\_\_

Pressure (PS) x Volume (V): \_\_\_\_\_



## Category



SEP



I



II



III



IV

# PED Selection



## Vessel

Design Pressure (Bar): \_\_\_\_\_

Volume (Liters): \_\_\_\_\_

Pressure (PS) x Volume (V): \_\_\_\_\_

STEP 1



## Gas



## Liquid\*

STEP 2



## Group 1



## Group 2

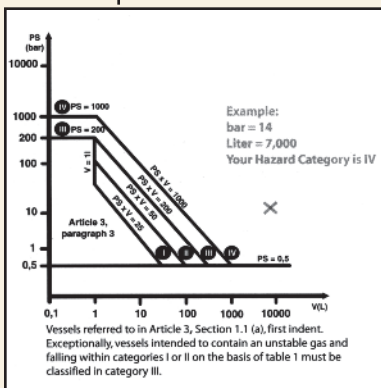


## Group 1

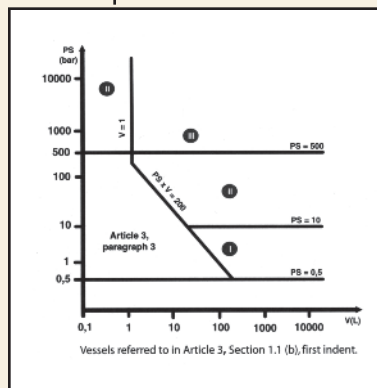


## Group 2

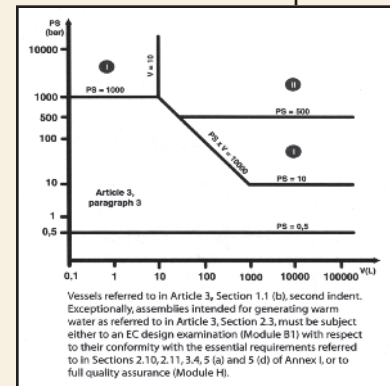
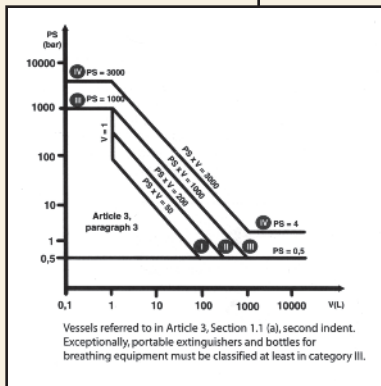
STEP 3



Enter Table  
with maximum  
allowable  
Pressure (PS)  
in Bar; Volume in  
Liters (V)



STEP 4



## Category



SEP



I



II



III



IV

## Category



SEP



I



II



III



IV

## Category



SEP



I



II



III



IV

## Category



SEP



I



II



III



IV

STEP 5

Use the  
table to  
determine  
Conformity  
Assessment  
Category



# Guide



## Piping

Design Pressure (Bar): \_\_\_\_\_

Pipe Diameter (DN or mm): \_\_\_\_\_

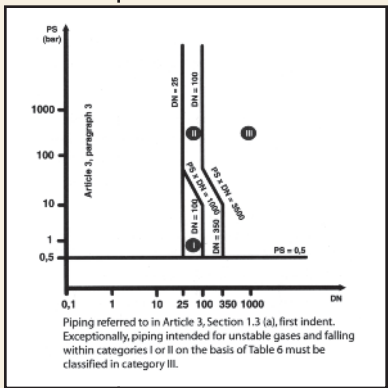
Pressure (PS) x Pipe Diameter (DN or mm) (V): \_\_\_\_\_



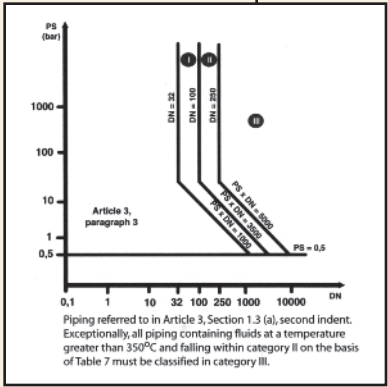
## Gas



### Group 1



### Group 2



### Category

- ☐ SEP
- ☐ I
- ☐ II
- ☐ III
- ☐ IV

### Category

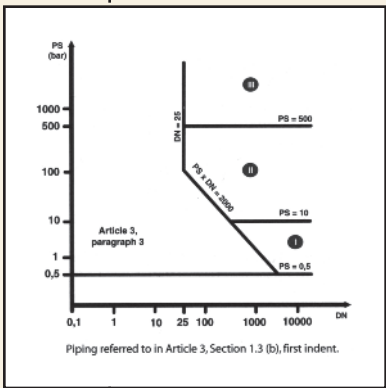
- ☐ SEP
- ☐ I
- ☐ II
- ☐ III
- ☐ IV



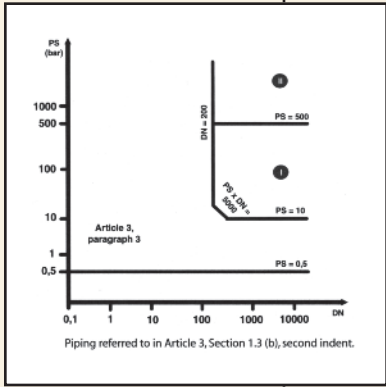
## Liquid\*



### Group 1



### Group 2



### Category

- ☐ SEP
- ☐ I
- ☐ II
- ☐ III
- ☐ IV

### Category

- ☐ SEP
- ☐ I
- ☐ II
- ☐ III
- ☐ IV

Enter Table  
with maximum  
allowable  
Pressure (PS)  
in Bar;  
Diameter (DN)

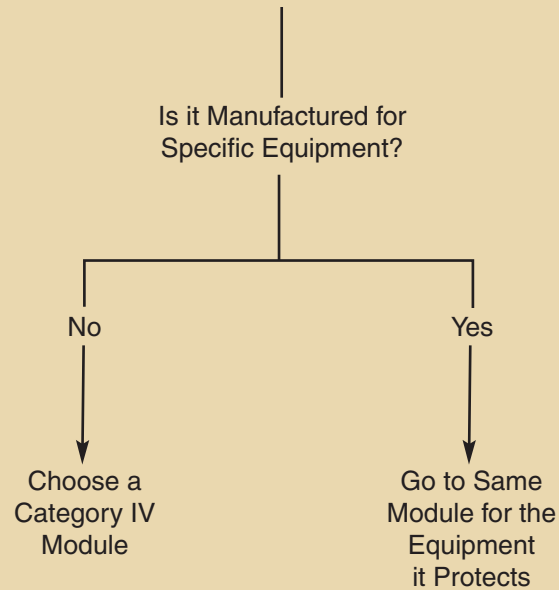
## SAFETY ACCESSORIES PRESSURE ACCESSORIES ASSEMBLIES

**Safety Accessories** – Devices designed to protect pressure equipment against the allowable limits being exceeded. Either choose Hazard Category IV or the same category of the equipment that it will protect.

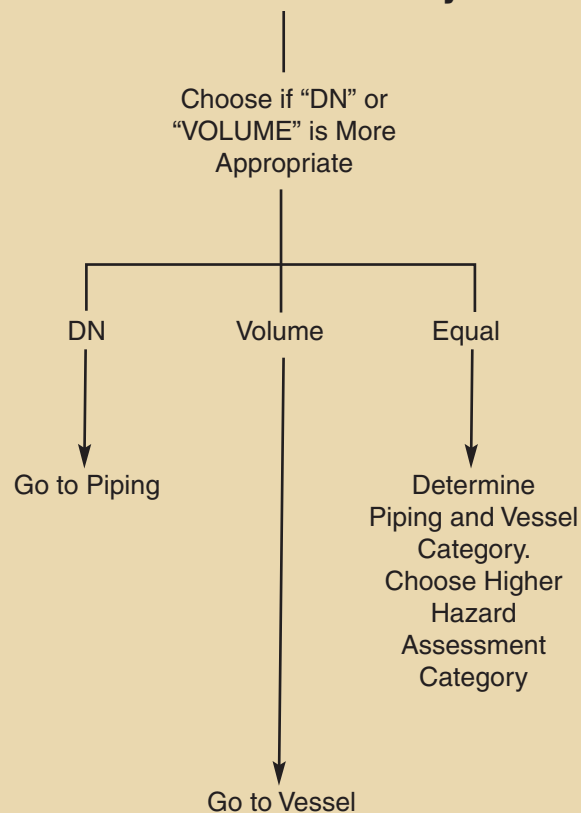
**Pressure Accessories** – Devices with an operational function and having pressure-bearing housings. Determine Hazard Category as either piping or vessel, whichever is appropriate. Or determine piping and vessel Hazard Category and choose the higher category.

**Assemblies** – Several pieces of pressure equipment assembled by a manufacturer to constitute an integrated and functional whole. For example, systems or skids that contain pressure vessels, piping, safety devices and/or pressure accessories.

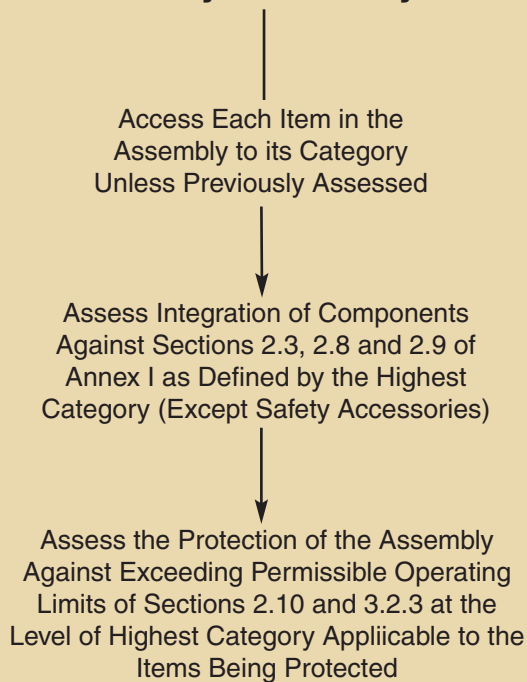
### Safety Accessory



### Pressure Accessory

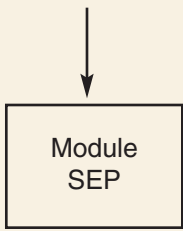


### Safety Accessory

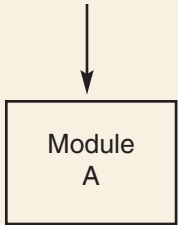




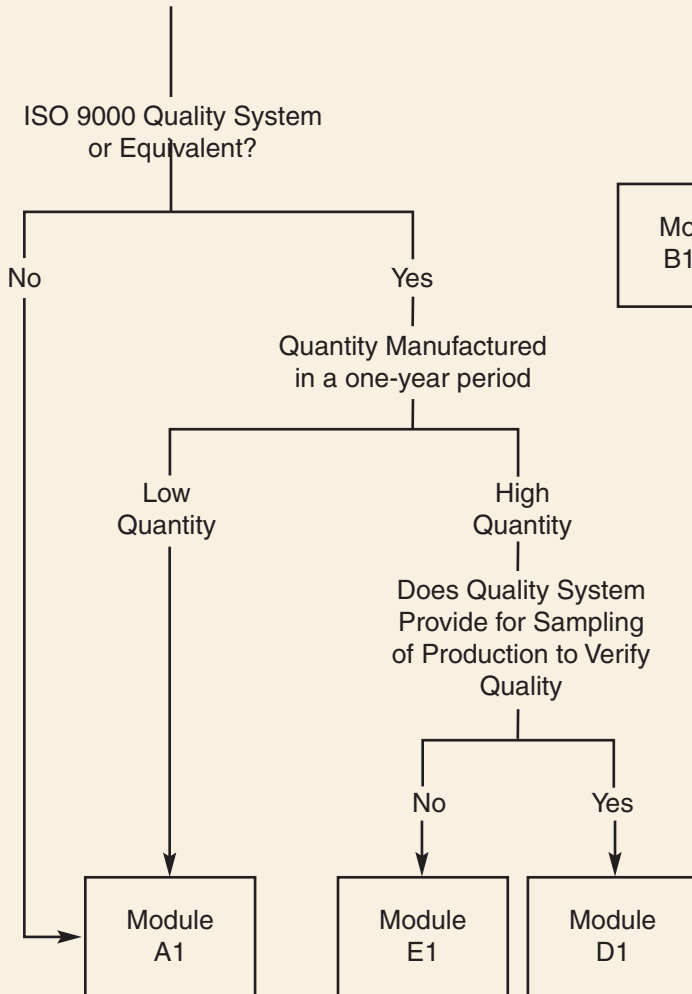
## SEP



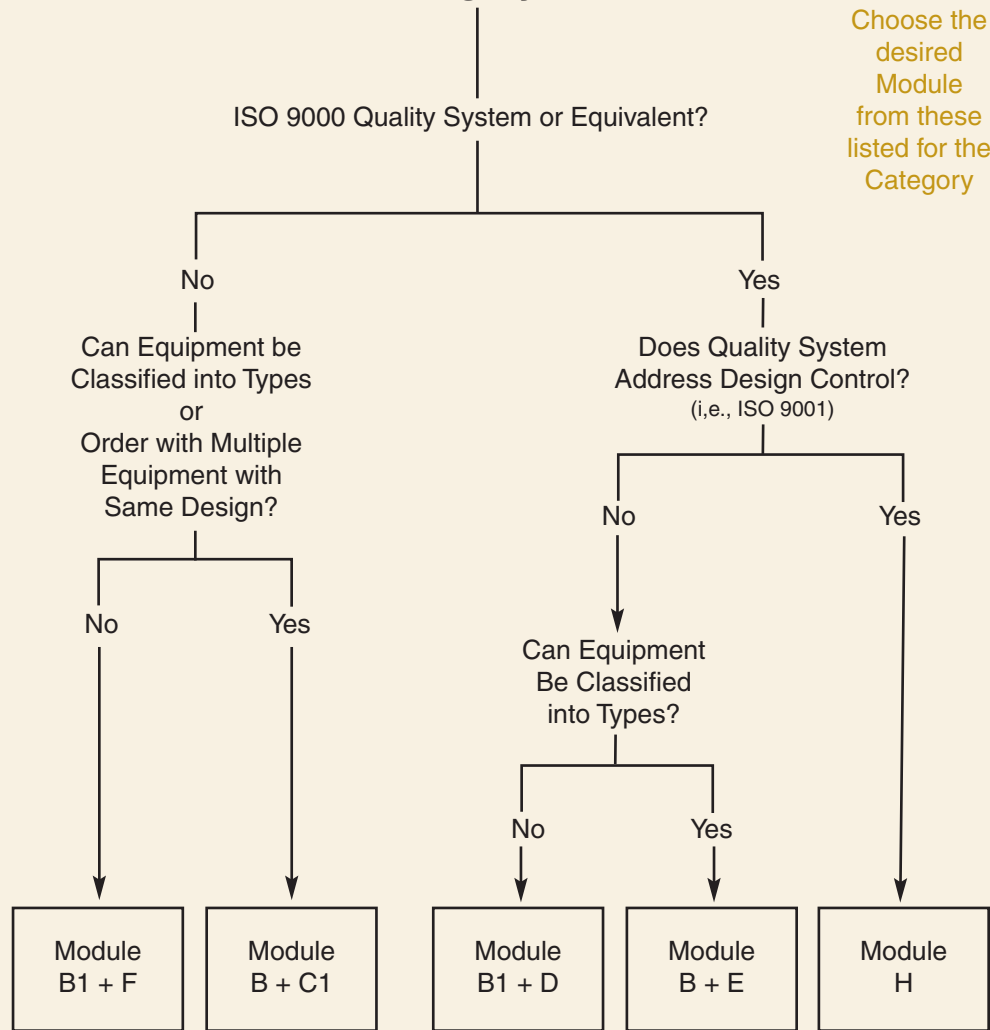
## Category I



## Category II



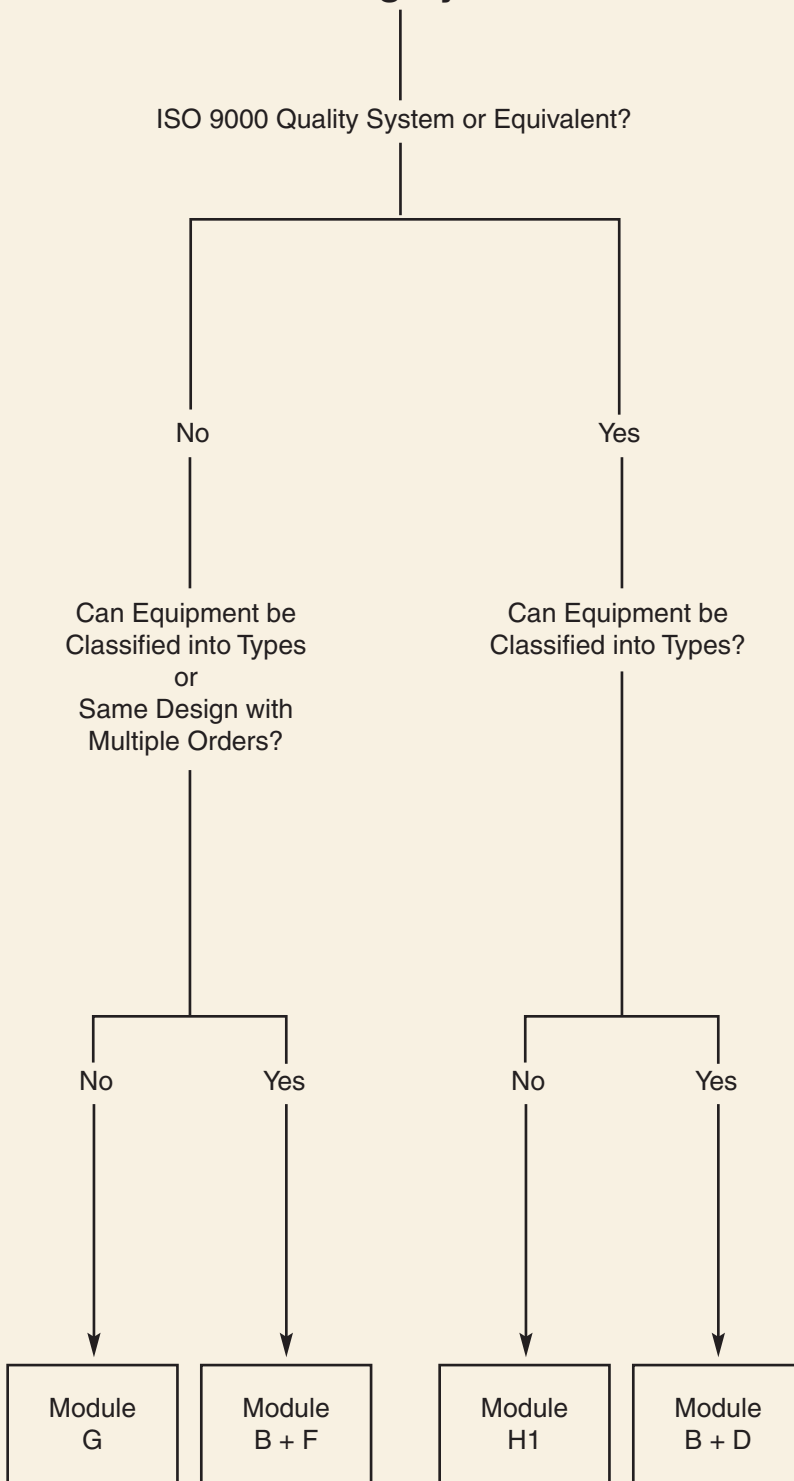
## Category III



## STEP 6

Choose the desired Module from these listed for the Category

## Category IV



### Sound Engineering Practice (SEP) –

Article 3 Paragraph 3 in the referenced Table indicates that the pressure equipment must meet SEP. Pressure equipment or assemblies that fall within the limits of SEP must be designed and manufactured in accordance with the sound engineering practice of a Member State. The pressure equipment is not CE Marked and there is no Notified Body involvement. If you need assistance in meeting SEP requirements, contact HSB Global Standards.

**Category I** – CE Marking with no Notified Body involvement, self-certifying. If you need assistance in meeting PED requirements, contact HSB Global Standards.

**Category II** – CE Marking with Notified Body involvement. The Notified Body will either perform unexpected visits, Module A1 or audit a quality system, Modules D1 and E1. The quality system is similar to ISO 9000 standards. Certification to ISO 9000 is not required.

**Category III** – CE Marking with Notified Body involvement. For these categories, the Notified Body is required to approve the design or type for all Conformity Assessment Procedures, with exception of Module H. For Module H, the manufacturer has an approved quality system that is equivalent to ISO 9001 and includes procedures for design control. The Notified body does not approve Particular Material Appraisal (PMA) and for “one-off” fired or otherwise heated pressure equipment perform a final inspection.

**Category IV** – CE Marking with Notified Body involvement. For these categories, the Notified Body is required to review or approve the design or type for all Conformity Assessment Procedures.

## PED ESTIMATE REQUEST FORM

### INSTRUCTIONS:

Fax completed form to PED Estimate Manager at (860) 722-5705 for a free price estimate.

For additional copies, go to [www.hsbglobalstandards.com](http://www.hsbglobalstandards.com)

COMPANY NAME		CONTACT NAME	
ADDRESS (No., Street)		CITY	STATE ZIP CODE
TELEPHONE NUMBER ( ) -		FAX NUMBER ( ) -	
EMAIL ADDRESS			

	EQUIPMENT NAME/SERIAL NO.	EQUIPMENT TYPE	DESIGN PRESSURE (BAR) / (PS)	VOLUME/ LITER (V)	DIAMETER (DN) (if piping)	FLUID (Gas / Liquid)	FLUID GROUP (1 & 2)	HAZARD CATEGORY	MODULE (S)
1									
2									
3									
4									
5									

Please answer the following questions, as applicable, to help with the quote process.

1. If applicable, provide the common fluid name and approximate chemical composition to be used in the pressure vessel?

2. Does your Company have an ISO 9000 type Quality system?

☐ Yes ☐ No (If "Yes", how many employees?) \_\_\_\_\_ (If "Yes", who is your Registrar?) \_\_\_\_\_

3. For Hazard Category II and higher:

a. Will permanent-joining (i.e., welding, brazing, etc.) procedures require Notified Body or Recognized Third Party approval?

☐ Yes ☐ No (If "Yes", how many procedure qualification tests are required?) \_\_\_\_\_

b. Will permanent-joining (i.e., welding, brazing, etc.) personnel require Notified Body or Recognized Third Party approval?

☐ Yes ☐ No (If "Yes", how many performance qualification tests are required?) \_\_\_\_\_

4. For Hazard Category III and IV:

a. Is Nondestructive Examination (NDE) of permanent joints required per the construction standard that is used to meet the PED?

☐ Yes ☐ No

(If "Yes", will NDE personnel need to be approved by a Notified Body or Recognized Third Party Organization?) ☐ Yes ☐ No

b. What is the construction code that will be used to meet the PED?

☐ ASME Section \_\_\_\_\_ ☐ AD Merkblatt ☐ CODAP ☐ JIS ☐ EN Harmonized Standard

☐ Other: \_\_\_\_\_

c. How many different designs will require approval? \_\_\_\_\_

In order to provide an estimate of the time to perform the review, a general arrangement drawing or sketch of the equipment will have to be submitted to HSB International.

d. What material standards will be used (ASME, ASTM, EN, etc.) \_\_\_\_\_

i. How many different material specifications will be used? \_\_\_\_\_

ii. How many particular material appraisals (PMA's) will require approval? \_\_\_\_\_

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offers inspection and engineering services to business and Industry. HSB Global Standards is the largest Authorized Inspection Agency (AIA) accredited by the American Society of Mechanical Engineers (ASME®) for boilers, pressure vessels, nuclear components, process and power plants.

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