

## Certification of pressurized equipment

in accordance with Order No. 743 of 23 September 1999  
from Arbejdstilsynet



# PED - Guide

## FORCE Certification A/S

FORCE Certification A/S has been appointed by the Danish Working Environment Service as notified body and independent third party body in accordance with the Order No. 743 of 23 September 1999 from Arbejdstilsynet. This order implements Directive No. 97/23/EC on Pressure Equipment (PED).

In this context FORCE Certification A/S has prepared the present guide to assist manufacturers of pressure equipment to obtain an easy understanding of the requirements placed by the order for pressure-bearing equipment.

After examining points 1 to 4, in point 5 you should select a procedure for evaluating conformity. If you should wish information on the implications of choices made, do not hesitate to get in touch with one of the personnel listed on the back page.

### 1. Determine the manufacturer

Determine who the manufacturer of the pressure equipment is, i.e. the one who maintains contact with the notified body (if relevant) and the one that issues the declaration of conformity and CE marks the equipment.

### 2. Determine the type of equipment

Vessel	<input type="checkbox"/>	A housings made for the storage of fluids* under pressure
Pipe systems	<input type="checkbox"/>	Piping components intended for the transport of fluids
Boilers, etc	<input type="checkbox"/>	Equipment fired or heated in some other way for production of steam or superheated water
Safety accessories	<input type="checkbox"/>	Installations to prevent pressurized equipment exceeding permitted limits
Pressure accessories	<input type="checkbox"/>	Operating installations with pressurized housings

\* Fluids: All pure gases, liquids and vapour and mixtures thereof

### 3. Determine data

Max. allowable pressure	PS	bar gauge
Allowable temperature	TS max.	°C
	TS min.	°C
Volume (vessel)	V	litres
Nominal diameter (pipes)	DN	(no dimensions)
Fluids	<input type="checkbox"/>	Group 1 *
	<input type="checkbox"/>	Group 2 **

\* Group 1 fluids: explosive, extremely highly flammable, highly flammable, flammable, very toxic, toxic, or oxidizing

\*\* Group 2 fluids: Other fluids besides those in Group 1

## 4. Determine the equipment's classification

For each type of equipment the 5 subheadings show the category which the equipment falls into depending on the product figure (PSxV / PSxDN) and fluid group, and, in the case of liquids, vapour pressure at the maximum temperature.

### 4.1 Vessel

Pressure (PS) x volume (V) = \_\_\_\_\_ bar x litre

Content	Fluids	Limits	Category
Gases, liquefied gases, gases dissolved under pressure vapour and liquids with vapour pressures > 0.5 bar at TS max.  Vessels for unstable gases at least category III. Fire extinguishers and cylinders for breathing apparatus at least category III.	Group 1 (dia.1)	$25 < PSxV \leq 50$ and $V > 1$	I
		$50 < PSxV \leq 200$ and $V > 1$	II
		$200 < PSxV \leq 1000$ and $V > 1$ or $200 < PS \leq 1000$ and $V < 1$	III
		$1000 < PSxV$ or $1000 < PS$	IV
	Group 2 (dia.2)	$50 < PSxV \leq 200$ and $V > 1$	I
		$200 < PSxV \leq 1000$ and $V > 1$	II
		$1000 < PSxV \leq 3000$ and $V > 1$ or $1000 < PS \leq 3000$ and $V < 1$ or $1000 < V$ and $PS \leq 4$	III
		$3000 < PSxV$ and $4 < PS$ or $3000 < PS$	IV
Liquids whose vapour pressures at TS max. $\leq 0,5$ bar	Group 1 (dia.3)	$200 < PSxV$ and $PS \leq 10$	I
		$200 < PSxV$ and $1 < V$ and $10 < PS \leq 500$	II
		$V \leq 1$ and $500 < PS$	II
		$1 < V$ and $500 < PS$	III
	Group 2 (dia.4)	$10000 < PSxV$ and $10 < PS \leq 500$	I
		$1000 < PS$ and $V \leq 10$	I
		$10000 < PSxV$ and $10 < V$ and $500 < PS$	II

### 4.2 Fired for production of steam/superheated water

Pressure x volume = \_\_\_\_\_ bar x litre      Volume > 2 litre

Limits (diagram 5)	Category
$PSxV \leq 50$	I
$PS \leq 32$ and $50 < PSxV \leq 200$	II
$PS \leq 32$ and $200 < PSxV \leq 3000$ and $V \leq 1000$	III
$PS > 32$ or $PSxV > 3000$ or $1000 \leq V$	IV

Pressure cookers must always be subject to construction checks at least equivalent to category III

### 4.3 Pipe systems

Pressure(PS) x nominal diameter(DN) = \_\_\_\_\_ bar

Content	Fluids	Limits	Category
Gases, liquefied gases, gases dissolved under pressure vapour and liquids with vapour pressures > 0.5 bar at TS max. Pipe systems for unstable gases always category III.	Group 1 (dia.6)	$25 < DN \leq 100$ and $PS \times DN \leq 1000$	I
		$PS \leq 10$ and $100 < DN \leq 350$ or $10 < PS$ and $1000 < PS \times DN \leq 3500$ or $35 < PS$ and $25 < DN \leq 100$	II
		$100 < DN$ and $3500 < PS \times DN$ or $350 < DN$	III
	Group 2 (dia.7)	$1000 < PS \times DN \leq 3500$ and $32 < DN$ or $32 < DN \leq 100$ and $35 < PS$	I
		$3500 < PS \times DN \leq 5000$ and $100 < DN$ or $5000 < PS \times DN$ and $100 < DN \leq 250$	II *)
		$5000 < PS \times DN$ and $250 < DN$	III
Liquids whose vapour pressures at TS max. $\leq 0,5$ bar	Group 1 (dia.8)	$PS < 10$ ; $PS \times DN > 2000$	I
		$25 < DN$ and $PS \times DN > 2000$ and $10 < PS \leq 500$	II
		$DN > 25$ ; $PS > 500$	III
	Group 2 (dia.9)	$5000 < PS \times DN$ and $200 < DN$ and $10 < PS \leq 500$	I
		$200 < DN$ ; $500 < PS$	II

\*) In case of fluid temperature over 350°C category III

### 4.4 Safety accessory

Always category IV. If the equipment is solely intended for use with a specific piece of pressurized equipment and this is of a lower category, the safety accessory may, however, be put in the same category.

### 4.5 Pressure accessories

The category is determined as above for vessels or pipe systems.

## 5. Select module

The manufacturer must decide whether:

1. Production mainly consists of single units or whether production is principally series production?
2. It would be beneficial to use a documented quality assurance system (QAS) in connection with determining conformity?

The below table shows the conformity modules that may be chosen.

Category	Single unit production		Series production	
	With QAS	Without QAS	With QAS	Without QAS
I		A		A
II	D1, E1	A1	D1, E1	A1
III	B1 + D, H	B1 + F	B + E, H	B + C1
IV	H1	G	B + D	B + F

## The contents of the modules

Module	Description
A	Manufacturers attend to internal manufacturing control, themselves producing and storing the documentation. The notified body not involved.
A1	Manufacturers attend to internal manufacturing control, themselves producing and storing the documentation. The notified body monitors the final verification through unannounced visits.
B	Manufacturers draw up the technical documentation and provide samples. The notified body examines the technical documentation and undertakes the necessary testing of the samples and issues an EEC type testing certificate.
B1	The manufacturer draws up the technical documentation. The notified body examines the technical documentation and issues an EEC construction testing certificate.
C1	Manufacturers ensure that production conforms to the specifications of the type approval. The notified body monitors the final verification through unannounced visits.
D	Manufacturers use a documented quality assurance system that covers production, final inspection and testing. The notified body audits, approves and monitors the quality assurance system.
D1	As D but manufacturers must also draw up and file technical documentation for the equipment.
E	Manufacturers use a documented quality assurance system that covers final inspection and testing. The notified body audits, approves and monitors the quality assurance system.
E1	As E but manufacturers must also draw up and file technical documentation for the equipment.
F	Manufacturers ensure that production conforms to the specifications of the type approval or the construction testing certificate. The notified body inspects each product. The authorized body issues a certificate of conformity.
G	The manufacturer draws up and submits the technical documentation. The notified body examines the technical documentation, manufacture and each individual product. The notified body issues a certificate of conformity.
H	Manufacturers use a documented quality assurance system that covers construction, production, final inspection and testing. The notified body audits, approves and monitors the quality assurance system.
H1	As H but manufacturers must also apply for construction approval from the same notified body that monitors the quality assurance system.

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