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Infoservice PED & EN 10253

This information regarding the European Standard for pipes and fittings and the Pressure Equipment Directive 97/23/EC is a exclusive service provided by ERNE Fittings GmbH, released for the TUBE in April 2006.

Pressure Equipment Directive

The application of the Pressure Equipment Directive 97/23/EC (PED) is mandated by law for all pressure equipment, including piping. Principally it applies to pressures above 0.5 bar. However, the PED is of practical consequences mainly at high pressures, which is dependent on the facility's volume and the fluid it contains. There are also areas, such as nuclear facilities or pipelines, which are excluded.

The PED regulates the CE marking of pressure equipment, by which the manufacturer certifies that the piece corresponds to the Directive. Depending on the pressure, volume and the danger level of the medium (state of aggregation, gaseous or liquid, or combustibility), a subdivision into four categories is made. These categories in turn determine which module of the PED has to be applied in the documentation so that the equipment corresponds to the Directive. In part, it is required that notified bodies (e.g. TÜV) be included.

In addition, essential safety requirements are also included in the Directive. Additional technical details are regulated by "harmonized" European Standards. When the harmonized standards are used, conformity with the Directive is assumed. The use of the harmonized standards is not mandatory, however, it makes the CE marking easier.

Materials / Components

The manufacturer of the pressure equipment, who undertakes the CE marking, requires documentation prepared by the material manufacturer affirming compliance with a specification. When a material manufacturer uses a certified Quality Assurance System (guidelines 7/2 and 7/16), the inspection certificate 3.1 is issued; otherwise the inspection certificate 3.2 is issued (guideline 7/5).

Materials include product types, such as cast pieces, and forged pieces (including forged flanges), bars, plates, seamless pipes and seamless fittings. Continuously machine-welded tubes, i.e. tubes made from coils as starting materials in an automatic process, which are usually heat treated after welding, shall be, in terms of certification procedures, considered as materials (guideline 7/25).

If such materials are further processed, for example by the application of welding, such pieces are considered components, but in the PED sense they are not yet pressure equipment. Examples of which are pipes welded from individual plates, or welded fittings.

For such components, the pressure equipment manufacturer requires, aside from the material certificates from the material supplier (e.g. manufacturer of the plates), additional documents (guideline 7/19), including to the degree applicable:

- Approval of welders and welding procedures
- NDT operator qualifications,
- Test reports,
- Information about forging and heat treatment etc.

According to the fittings standard prEN 10253, these documents are required for fittings that underwent welding as part of the manufacturing process. For fittings that are manufactured from welded pipe, in addition to the starting material certificate, information regarding the forging and heat treatment is required. For fittings that are manufactured from seamless pipe, a starting material certificate is not required.

Pipe Standards

Intended for use in the area of validity of the PED mainly the Standards EN 10216 and EN 10217 “Steel Tubes for Pressure Purposes”. These Standards are considered for harmonization and they consist of multiple parts:

	Seamless	Welded
Room temperature	EN 10216-1	EN 10217-1
Elevated Temperatures	EN 10216-2	EN 10217-2 EN 10217-5
Fine Grain Steel	EN 10216-3	EN 10217-3
Low Temperatures	EN 10216-4	EN 10217-4 EN 10217-6
Stainless Steel	EN 10216-5	EN 10217-7

For pressure purposes, in addition, the EN 10208-2 “Steel pipes for pipelines of combustible fluids, technical delivery conditions – pipes of delivery class B” is to be mentioned. However, due to its predominant application in pipelines (excluded from the PED) this Standard will not be harmonized.

Pipe Classes of the Chemical Industry

In October 2005, the German chemical industry made public the PAS 1057 specification “Pipe classes for process plants”. Considered as a pipe class are parts such as pipes, fittings, flanges with different diameters made from one material designed for the same nominal pressure.

The design follows from the European Norm EN 13480 “Industrial piping” and not from German regulations.

Also for the parts themselves, reference is made to European Norms (e.g. EN 10216). For fittings, for which the European Norms are not yet existent, reference is still made to the DIN standards.

Fittings Standards

The European Standard EN 10253 “butt-welding pipe fittings” describes fittings and consists of four parts. Part 2 and Part 4 are planned for harmonization.

	Without specific inspection requirements	With specific inspection requirements
Non-alloy and ferritic alloy steel	EN 10253-1 (1999)	prEN 10253-2 (2005)
Stainless steel	prEN 10253-3 (2005)	prEN 10253-4 (2005)

Part 1 of the Standard was already issued in 1999. Parts 2 through 4 are, as of early 2006, solely “white drafts”. These parts may be issued as Standards by early 2007.

Types of Fittings

In prEN 10253-2 and prEN 10253-4, two types of fittings are described; similar to products covered by the two the German fittings standards (e.g. DIN 2605-1 and DIN 2605-2).

Fittings of **Type A** are characterized in that they have the same wall thickness in the body as at the welding ends. Their resistance to internal pressure is, in general, less than that of a straight pipe of the same dimension. (Reduced pressure factor).

Fittings of **Type B** are designed to resist the same internal pressure as a straight pipe with the same nominal dimension, and have, in general, a wall thickness in the body of the fitting that is greater than the nominal thickness. (Full pressure factor).

	EN 10253-1	prEN 10253-2	prEN 10253-3	prEN 10253-4
Applicable to PED		X		X
Non-alloy and alloy steel	X	X		
Stainless steel			X	X
Establishment of:				
• Geometry	X	X	X	X
• Material	X	X	X	X
• Delivery requirements	X	X	X	X
• Internal pressure resistance		X		X
Fittings with reduced pressure factor (Type A)	X	X	X	X
Fittings with full pressure factor (Type B)		X		X
Inspection documents	2.2	3.1 (3.2)	2.2 (others)	3.1 (3.2)
Number of materials	1 + 1	24	25	25
Diameter	21,3 - 406,8 mm	21,3 - 1219 mm	21,3 - 1016 mm	21,3 - 1016 mm
Wall thickness series	1 + 2	8	6	6
Elbows	2D, 3D, 5D	2D, 3D, 5D	2D, 3D, 5D ID+100, 3ID, 5ID	2D, 3D, 5D ID+100, 3ID, 5ID
Tees	regular	regular	regular, pulled, branch welded	regular, pulled, branch welded
Reducers	concentric, eccentric	concentric, eccentric	concentric, eccentric	concentric, eccentric
Caps	caps, dished ends	caps	caps	caps

Materials in the Standard for Fittings EN 10253

The **EN 10253-1** contains only two materials, the S235, which replaces the St 37.0 from the DIN 2609 and the S265 mentioned in the annex.

The **prEN 10253-2** contains non-alloy and alloy steels for various applications, which, in part, correspond to materials in the DIN 2609:

	prEN 10253-2	DIN 2609
Room temperature	P235TR2	<i>A St 37.0</i>
	P265TR2	<i>B St 44.0</i>
Elevated Temperatures	P235GH	<i>F St 35.8 I</i> <i>G St 35.8 III</i>
	P265GH	
	16Mo3	H 15 Mo 3
	10CrMo5-5	
	13CrMo4-5	J 13 CrMo 4 4
	10CrMo9-10	K 10 CrMo 9 10
	X11CrMo5	
	X11CrMo9-1	
	X10CrMoVNb9-1	
Fine Grain Steel	P355N	<i>C St 52.0</i>
	P355NH	R WStE 355
	P355NL1	S TStE 355
Low Temperatures	P215NL	
	P265NL	<i>T TStE 285</i>
	12Ni14	U 10 Ni 14
	X10Ni9	
Combustible Fluids	L290NB	D StE 290.7
	L360NB	E StE 360.7
	L360QB	
	L415NB	
	L415QB	
	L450QB	

grey: similar, but not equivalent

The proposals **prEN 10253-3** and **prEN 10253-4** pertain to all austenitic and austenitic-ferritic stainless steels which are enclosed in EN 10217-7 for welded pipes made of stainless steel.



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For further information regarding the PED, EN 10253 or the business and products of ERNE Fittings, please contact us directly or visit our website www.ernefittings.com.

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