

# DIN EN 13480-4:2024-12 (E)

## Metallic industrial piping - Part 4: Fabrication and installation

---

<b>Contents</b>		<b>Page</b>
European foreword .....		5
1	Scope .....	7
2	Normative references .....	7
3	Terms and definitions .....	8
4	Symbols .....	9
5	General .....	9
5.1	Requirements on the manufacturer .....	9
5.2	Requirements on fabricators and installers of piping and supports .....	9
5.3	Requirements for fabrication and installation .....	9
5.4	Classification of piping .....	10
5.5	Material grouping .....	10
5.6	Tolerances .....	10
6	Cutting and bevelling .....	10
6.1	General .....	10
6.2	Identification of pressure parts .....	10
7	Bending and other forming .....	11
7.1	General .....	11
7.2	Heat treatment after cold forming .....	13
7.2.1	Flat products .....	13
7.2.2	Pipes .....	13
7.3	Heat treatment after hot forming .....	15
7.3.1	Material groups 1, 3, 4, 5 and 6 .....	15
7.3.2	Material groups 8.1 and 8.2 .....	15
7.3.3	Heat treatment after hot forming for material group 10 .....	17
7.3.4	Heat treatment after hot forming for clad materials .....	17
7.4	Tolerances .....	17
7.4.1	Out-of-roundness of bends under internal pressure equal to, or greater than, the external pressure .....	17
7.4.2	Out-of-roundness of bends under external pressure and vacuum .....	18
7.4.3	Waves at bends .....	18
7.4.4	Start-up bulge of induction bends .....	19
7.5	Surface finish .....	19
8	Installation of piping .....	19
8.1	Fixing and alignment .....	19
8.2	Field run piping .....	20
8.3	Flanged or similar mechanical connections .....	21
8.3.1	Flange connections .....	21
8.3.2	Threaded connections .....	22
8.3.3	Couplings and compression fittings .....	22
8.4	Protection of ends of piping components .....	22
9	Welding .....	22
9.1	Welding personnel .....	22
9.2	Welding procedure specifications .....	22

9.3	Welding procedures .....	23
9.3.1	Verification of suitability .....	23
9.3.2	Application .....	24
9.4	Filler metals and auxiliary materials .....	24
9.5	Climatic conditions .....	24
9.6	Cleaning before and after welding .....	24
9.7	Joint preparation .....	25
9.8	Edge protection .....	25
9.9	Assembly for welding .....	25
9.10	Earthing .....	25
9.11	Performance of welding .....	26
9.11.1	Preheating .....	26
9.11.2	Striking marks .....	26
9.11.3	External welds .....	26
9.11.4	Dissimilar joints .....	26
9.12	Backing rings .....	26
9.13	Attachments .....	27
9.13.1	General .....	27
9.13.2	Temporary attachments .....	27
9.13.3	Permanent attachments .....	27
9.14	Post-weld heat treatment .....	27
9.14.1	General .....	27
9.14.2	Equipment .....	31
9.14.3	Temperature measurements .....	31
9.14.4	Controlling thickness .....	31
9.14.5	Rate of heating .....	33
9.14.6	Local heat treatment .....	33
9.14.7	Insulation .....	34
9.15	Weld identification .....	34
10	Adjustment and repair .....	34
10.1	General .....	34
10.2	Adjustment .....	34
10.2.1	Cold hammering .....	34
10.2.2	Adjustments by means of heat .....	34
10.2.3	Adjustment by welding .....	35
10.2.4	Adjustment by local forging .....	35
10.3	Weld repair .....	35
11	Marking and documentation .....	35
11.1	Marking of spools and components for installation .....	35
11.2	Marking and identification of installed piping .....	35
11.2.1	General .....	35
11.2.2	CE Marking of installed piping .....	36
11.2.3	Technical identification of installed piping .....	36
12	Additional requirements .....	37
12.1	Cleaning .....	37
12.2	Temporary preservation .....	37
12.3	External corrosion protection .....	37
12.4	Thermal and acoustic insulation .....	37
12.5	Connections for static electricity .....	38
Annex A (informative)	Contamination and surface quality of stainless steel .....	39
A.1	Introduction .....	39
A.2	Protection .....	39
A.2.1	Handling .....	39
A.2.2	During fabrication and installation .....	39
A.3	Controlled cleaning methods .....	40
A.4	Chemical treatments .....	40
A.4.1	Acid pickling .....	40

<b>A.4.2</b>	<b>Decontamination, passivation .....</b>	<b>40</b>
<b>A.5</b>	<b>Preparing for shipment .....</b>	<b>41</b>
<b>Annex B (normative)</b>	<b>Dimensional tolerances for fabricated spools .....</b>	<b>42</b>
<b>Annex C (informative)</b>	<b>Example for the extension of the P value .....</b>	<b>44</b>
<b>Annex ZA (informative)</b>	<b>Relationship between this European Standard and the Essential Requirements of EU Directive 2014/68/EU aimed to be covered .....</b>	<b>47</b>
<b>Bibliography</b>	<b>.....</b>	<b>49</b>