

ISO 16631:2016-03 (E)

Ductile iron pipes, fittings, accessories and their joints compatible with plastic (PVC or PE) piping systems, for water applications and for plastic pipeline connections, repair and replacement

Contents		Page
Foreword		v
1	Scope	1
2	Normative references	2
3	Terms and definitions	2
4	Technical requirements	6
4.1	General	6
4.2	General requirements	6
4.2.1	Pipes and fittings nominal sizes	6
4.2.2	Surface condition	6
4.2.3	Types of joints and interconnection	6
4.2.4	Materials in contact with water intended for human consumption	7
4.3	Pressure classification and dimensional requirements	8
4.3.1	Pressure classification	8
4.3.2	Diameter	8
4.3.3	Wall thickness	9
4.3.4	Length	9
4.3.5	Straightness of pipes	9
4.4	Material characteristics	9
4.4.1	Tensile properties	9
4.4.2	Brinell hardness	10
4.5	Coatings and linings for pipes	10
4.5.1	General	10
4.5.2	External coatings	10
4.5.3	Internal linings	10
4.6	Coatings and linings for fittings and accessories	10
4.7	Marking	11
4.8	Packaging and handling	11
5	Leaktightness requirements	11
5.1	Pipes and fittings	11
5.2	Flexible joints	12
5.2.1	General	12
5.2.2	Ductile iron socket assembled with ductile iron spigot end	12
5.2.3	Ductile iron socket assembled with plastic spigot end	13
6	Test methods	17
6.1	Dimensions	17
6.1.1	External diameter	17
6.1.2	Wall thickness	17
6.1.3	Length	17
6.2	Straightness of pipes	17
6.3	Tensile test	18
6.3.1	Centrifugally cast pipes	18
6.3.2	Fittings and accessories	18
6.3.3	Test bar	18

6.3.4	Equipment and test method	18
6.3.5	Test results	18
6.3.6	Test frequency	18
6.4	Brinell hardness	18
6.5	Works leaktightness test of pipes and fittings	19
6.5.1	General	19
6.5.2	Centrifugally cast pipes	19
6.5.3	Fittings	19
7	Type tests	19
7.1	Type tests on ductile iron spigot ends	19
7.1.1	Leaktightness of joints to internal pressure	19
7.1.2	Leaktightness of joints to external pressure	20
7.1.3	Leaktightness of joints to negative internal pressure	21
7.2	Type tests on plastic spigot ends	21
7.2.1	General	21
7.2.2	Leaktightness of joints to internal hydrostatic pressure	21
7.2.3	Leaktightness of joints to negative internal pressure	23
7.2.4	Long-term hydrostatic strength test for joints of fittings for PE pipes	24
7.2.5	Pull out test at 25 °C for restrained joints for PE pipes	24
7.2.6	Long-term hydrostatic strength test for joints of fittings for PVC pipe	25
8	Tables of dimensions	25
8.1	Pipes	25
8.1.1	General	25
8.1.2	External diameters	26
8.1.3	Wall thickness	26
8.1.4	Pipes length	27
8.1.5	Sockets for push-in flexible joints	27
8.2	Fittings	28
8.2.1	General	28
8.2.2	Wall thickness	28
8.2.3	Sockets for push-in socketed fittings	28
8.2.4	Flanged socket	28
8.2.5	Flanged spigot	29
8.2.6	Collars	30
8.2.7	Double socket bend 90° (1/4)	31
8.2.8	Double socket bend 45° (1/8)	32
8.2.9	Double socket bend 22°30' (1/16)	33
8.2.10	Double socket bend 11°15' (1/32)	34
8.2.11	Double socket tee with flanged branch	35
8.2.12	All socket tee	37
8.2.13	Double socket taper	39
Annex A (informative)	External coating	41
Annex B (informative)	Internal lining	42
Annex C (normative)	Stiffness determination	43
Annex D (normative)	Quality assurance	44
Annex E (informative)	Safety factors	45
Annex F (normative)	Water pipeline systems incorporating ductile iron and plastic components	46
Annex G (informative)	Environmental aspects	47
Bibliography	48