

# DIN ISO 16611:2020-01 (E)

Plastics piping systems for drainage and sewerage without pressure - Non-circular pipes and joints made of glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resins (UP) - Dimensions, requirements and tests (ISO 16611:2017)

---

<b>Contents</b>		<b>Page</b>
National foreword .....		4
National Annex NA (informative) <b>Bibliography</b> .....		4
Foreword .....		5
Introduction .....		6
<b>1</b>	<b>Scope</b> .....	<b>7</b>
<b>2</b>	<b>Normative references</b> .....	<b>7</b>
<b>3</b>	<b>Terms and definitions</b> .....	<b>8</b>
<b>4</b>	<b>General requirements</b> .....	<b>14</b>
4.1	Classification .....	14
4.1.1	Categories .....	14
4.1.2	Nominal size .....	14
4.2	Materials .....	14
4.2.1	General .....	14
4.2.2	Reinforcement .....	14
4.2.3	Resin .....	15
4.2.4	Aggregates and fillers .....	15
4.2.5	Elastomers .....	15
4.2.6	Metals .....	15
4.3	Wall construction .....	15
4.3.1	Inner layer .....	15
4.3.2	Structural layer .....	15
4.3.3	Outer layer .....	16
4.3.4	Appearance .....	16
4.4	Reference conditions for testing .....	16
4.4.1	Temperature .....	16
4.4.2	Properties of water for testing .....	16
4.4.3	Loading conditions .....	16
4.4.4	Conditioning .....	16
4.4.5	Measurement of dimensions .....	16
4.4.6	Elapsed time for determination of long-term properties, (x) .....	16
4.5	Joints .....	17
4.5.1	General .....	17
4.5.2	Types of joint .....	17
4.5.3	Flexibility of the jointing system .....	17
4.5.4	Sealing ring .....	17
4.5.5	Adhesives .....	17
<b>5</b>	<b>Pipes</b> .....	<b>17</b>
5.1	Geometrical characteristics .....	17
5.1.1	Dimensions .....	17
5.2	Mechanical characteristics .....	18
5.2.1	General .....	18
5.2.2	Short-term bending modulus .....	19
5.2.3	Long-term creep bending modulus .....	20
5.2.4	Short-term bending strength .....	20

	5.2.5	Long-term bending strength .....	21
	5.2.6	Resistance to strain corrosion.....	22
	5.2.7	Minimum initial longitudinal tensile strength.....	23
	5.3	Marking.....	24
<b>6</b>		<b>Fittings .....</b>	<b>25</b>
	6.1	All types.....	25
	6.1.1	General.....	25
	6.1.2	Diameter series.....	25
	6.1.3	Mechanical characteristics of fittings .....	25
	6.1.4	Installed leak tightness of fittings.....	25
	6.1.5	Dimensions.....	25
	6.2	Marking.....	25
<b>7</b>		<b>Joint performance .....</b>	<b>26</b>
	7.1	General.....	26
	7.1.1	Requirements.....	26
	7.1.2	Test temperature .....	26
	7.1.3	Dimensions.....	26
	7.2	Flexible joints.....	26
	7.2.1	General.....	26
	7.2.2	Maximum allowable draw .....	26
	7.2.3	Maximum allowable angular deflection .....	26
	7.2.4	Maximum allowable misalignment.....	26
	7.2.5	Flexible non-end-load-bearing joints with elastomeric sealing rings.....	26
	7.3	Rigid joints.....	28
	7.3.1	Wrapped or cemented.....	28
		<b>Annex A (informative) Examples for static calculation.....</b>	<b>30</b>
		<b>Bibliography .....</b>	<b>31</b>