

# ISO 11295:2022-01 (E)

## Plastics piping systems used for the rehabilitation of pipelines - Classification and overview of strategic, tactical and operational activities

---

<b>Contents</b>		<b>Page</b>
Foreword .....		v
Introduction .....		vi
<b>1</b>	<b>Scope .....</b>	<b>1</b>
<b>2</b>	<b>Normative references .....</b>	<b>1</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>1</b>
<b>3.1</b>	<b>General terms .....</b>	<b>2</b>
<b>3.2</b>	<b>Terms related to techniques .....</b>	<b>3</b>
<b>3.3</b>	<b>Terms related to services conditions .....</b>	<b>5</b>
<b>4</b>	<b>Abbreviated terms .....</b>	<b>5</b>
<b>5</b>	<b>Pipeline rehabilitation process .....</b>	<b>6</b>
<b>6</b>	<b>Investigation and condition assessment of the existing pipeline .....</b>	<b>6</b>
<b>6.1</b>	<b>Performance criteria .....</b>	<b>6</b>
<b>6.1.1</b>	<b>General .....</b>	<b>6</b>
<b>6.1.2</b>	<b>Hydraulic requirements .....</b>	<b>8</b>
<b>6.1.3</b>	<b>Structural requirements .....</b>	<b>8</b>
<b>6.1.4</b>	<b>Environmental requirement .....</b>	<b>8</b>
<b>6.1.5</b>	<b>Operational requirements .....</b>	<b>8</b>
<b>6.2</b>	<b>Investigation of performance .....</b>	<b>9</b>
<b>6.2.1</b>	<b>General .....</b>	<b>9</b>
<b>6.2.2</b>	<b>Hydraulic investigation .....</b>	<b>10</b>
<b>6.2.3</b>	<b>Structural investigation .....</b>	<b>10</b>
<b>6.2.4</b>	<b>Environmental investigation .....</b>	<b>11</b>
<b>6.2.5</b>	<b>Operational investigation .....</b>	<b>11</b>
<b>6.3</b>	<b>Condition assessment .....</b>	<b>11</b>
<b>6.4</b>	<b>Risk analysis .....</b>	<b>12</b>
<b>6.5</b>	<b>Control measures .....</b>	<b>12</b>
<b>7</b>	<b>Classification and characteristics of rehabilitation techniques .....</b>	<b>13</b>
<b>7.1</b>	<b>Overview .....</b>	<b>13</b>
<b>7.2</b>	<b>Classification of renovation techniques .....</b>	<b>14</b>
<b>7.2.1</b>	<b>General .....</b>	<b>14</b>
<b>7.2.2</b>	<b>Lining with continuous pipes .....</b>	<b>14</b>
<b>7.2.3</b>	<b>Lining with close-fit pipes .....</b>	<b>16</b>
<b>7.2.4</b>	<b>Lining with cured-in-place pipes .....</b>	<b>19</b>
<b>7.2.5</b>	<b>Lining with discrete pipes .....</b>	<b>23</b>
<b>7.2.6</b>	<b>Lining with adhesive-backed hoses .....</b>	<b>26</b>
<b>7.2.7</b>	<b>Lining with spirally-wound pipes .....</b>	<b>28</b>
<b>7.2.8</b>	<b>Lining with pipe segments .....</b>	<b>31</b>
<b>7.2.9</b>	<b>Lining with a rigidly anchored plastics inner layer .....</b>	<b>32</b>
<b>7.2.10</b>	<b>Lining with sprayed polymeric materials .....</b>	<b>34</b>
<b>7.2.11</b>	<b>Lining with inserted hoses .....</b>	<b>36</b>
<b>7.3</b>	<b>Classification of trenchless replacement techniques .....</b>	<b>37</b>
<b>7.3.1</b>	<b>General .....</b>	<b>37</b>
<b>7.3.2</b>	<b>Pipe bursting .....</b>	<b>38</b>

7.3.3	Pipe removal .....	40
7.3.4	Horizontal directional drilling (HDD) .....	42
7.3.5	Impact moling .....	45
7.3.6	Pipe jacking .....	47
8	Selection of rehabilitation techniques .....	50
8.1	General .....	50
8.2	Pipeline system layout .....	50
8.3	Hydraulic performance .....	51
ISO 11295:2022(E) 8.4	Structural performance .....	52
8.4.1	General .....	52
8.4.2	Non-pressure pipes .....	52
8.4.3	Pressure pipes .....	53
8.5	Environmental impact .....	56
8.6	Construction constraints .....	57
8.7	Project specification .....	57
9	Implementation of rehabilitation techniques .....	58
9.1	Preconstruction activities .....	58
9.2	Assessment of conformity of products .....	59
9.3	Inspection, storage and handling of the materials on site .....	59
9.4	Application of rehabilitation technique .....	59
9.4.1	Preparatory work .....	59
9.4.2	Construction .....	60
9.5	Acceptance control .....	60
9.5.1	General .....	60
9.5.2	Inspection .....	60
9.5.3	Leak tightness testing .....	61
9.5.4	Sampling .....	62
9.6	Completion of the work .....	62
9.6.1	Finishing off the rehabilitation work .....	62
9.6.2	Lateral reinstatement .....	62
9.7	Documentation of the process .....	62
Bibliography	.....	64