

# DIN EN ISO 11295:2022-12 (E)

## Plastics piping systems used for the rehabilitation of pipelines - Classification and overview of strategic, tactical and operational activities (ISO 11295:2022)

---

| <b>Contents</b>                |  | <b>Page</b> |
|--------------------------------|--|-------------|
| <b>European foreword</b> ..... |  | <b>4</b>    |
| <b>Foreword</b> .....          |  | <b>5</b>    |
| <b>Introduction</b> .....      |  | <b>6</b>    |
| <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>7</b>    |
| 3.1                            | General terms.....   | 8           |
| 3.2                            | Terms related to techniques.....   | 9           |
| 3.3                            | Terms related to services conditions.....                                    | 11          |
| <b>4</b>                       | <b>Abbreviated terms</b> .....   | <b>11</b>   |
| <b>5</b>                       | <b>Pipeline rehabilitation process</b> .....                                 | <b>12</b>   |
| <b>6</b>                       | <b>Investigation and condition assessment of the existing pipeline</b> ..... | <b>12</b>   |
| 6.1                            | Performance criteria.....  | 12          |
| 6.1.1                          | General.....   | 12          |
| 6.1.2                          | Hydraulic requirements.....  | 14          |
| 6.1.3                          | Structural requirements.....   | 14          |
| 6.1.4                          | Environmental requirement.....   | 14          |
| 6.1.5                          | Operational requirements.....  | 14          |
| 6.2                            | Investigation of performance.....  | 15          |
| 6.2.1                          | General.....   | 15          |
| 6.2.2                          | Hydraulic investigation.....   | 16          |
| 6.2.3                          | Structural investigation.....  | 16          |
| 6.2.4                          | Environmental investigation.....   | 17          |
| 6.2.5                          | Operational investigation.....   | 17          |
| 6.3                            | Condition assessment.....  | 17          |
| 6.4                            | Risk analysis.....   | 18          |
| 6.5                            | Control measures.....  | 18          |
| <b>7</b>                       | <b>Classification and characteristics of rehabilitation techniques</b> ..... | <b>19</b>   |
| 7.1                            | Overview.....  | 19          |
| 7.2                            | Classification of renovation techniques.....                                 | 20          |
| 7.2.1                          | General.....   | 20          |
| 7.2.2                          | Lining with continuous pipes.....  | 20          |
| 7.2.3                          | Lining with close-fit pipes.....   | 22          |
| 7.2.4                          | Lining with cured-in-place pipes.....  | 25          |
| 7.2.5                          | Lining with discrete pipes.....  | 29          |
| 7.2.6                          | Lining with adhesive-backed hoses.....                                       | 32          |
| 7.2.7                          | Lining with spirally-wound pipes.....  | 34          |
| 7.2.8                          | Lining with pipe segments.....   | 37          |
| 7.2.9                          | Lining with a rigidly anchored plastics inner layer.....                     | 38          |
| 7.2.10                         | Lining with sprayed polymeric materials.....                                 | 40          |
| 7.2.11                         | Lining with inserted hoses.....  | 42          |
| 7.3                            | Classification of trenchless replacement techniques.....                     | 43          |
| 7.3.1                          | General.....   | 43          |
| 7.3.2                          | Pipe bursting.....   | 44          |
| 7.3.3                          | Pipe removal.....  | 46          |
| 7.3.4                          | Horizontal directional drilling (HDD).....                                   | 48          |
| 7.3.5                          | Impact moling.....   | 51          |
| 7.3.6                          | Pipe jacking.....  | 53          |

|          |   |           |
|----------|---|-----------|
| <b>8</b> | <b>Selection of rehabilitation techniques</b> .....             | <b>56</b> |
| 8.1      | General .....   | 56        |
| 8.2      | Pipeline system layout .....                                    | 56        |
| 8.3      | Hydraulic performance .....                                     | 57        |
| 8.4      | Structural performance .....                                    | 58        |
|          | 8.4.1 General .....   | 58        |
|          | 8.4.2 Non-pressure pipes .....                                  | 58        |
|          | 8.4.3 Pressure pipes .....                                      | 59        |
| 8.5      | Environmental impact .....                                      | 62        |
| 8.6      | Construction constraints .....                                  | 63        |
| 8.7      | Project specification .....                                     | 63        |
| <b>9</b> | <b>Implementation of rehabilitation techniques</b> .....        | <b>64</b> |
| 9.1      | Preconstruction activities .....                                | 64        |
| 9.2      | Assessment of conformity of products .....                      | 65        |
| 9.3      | Inspection, storage and handling of the materials on site ..... | 65        |
| 9.4      | Application of rehabilitation technique .....                   | 65        |
|          | 9.4.1 Preparatory work .....                                    | 65        |
|          | 9.4.2 Construction .....  | 66        |
| 9.5      | Acceptance control .....  | 66        |
|          | 9.5.1 General .....   | 66        |
|          | 9.5.2 Inspection .....  | 66        |
|          | 9.5.3 Leak tightness testing .....                              | 67        |
|          | 9.5.4 Sampling .....  | 68        |
| 9.6      | Completion of the work .....                                    | 68        |
|          | 9.6.1 Finishing off the rehabilitation work .....               | 68        |
|          | 9.6.2 Lateral reinstatement .....                               | 68        |
| 9.7      | Documentation of the process .....                              | 68        |
|          | <b>Bibliography</b> .....                                       | <b>70</b> |