

# DIN EN ISO 11296-4:2021-11 (E)

Plastics piping systems for renovation of underground non- pressure drainage and sewerage networks - Part 4: Lining with cured-in-place pipes (ISO 11296-4:2018 + Amd 1:2021) (includes Amendment A1:2021)

---

| <b>Contents</b>                                   |  | <b>Page</b> |
|---|--|-------------|
| European foreword .....                           |  | 4           |
| [A1] European foreword to Amendment A1 [A1] ..... |  | 5           |
| Foreword .....                                    |  | 6           |
| [A1] Foreword to Amendment 1 [A1] .....           |  | 8           |
| Introduction .....                                |  | 9           |
| <b>1</b>  | <b>Scope</b> .....   | <b>11</b>   |
| <b>2</b>  | <b>Normative references</b> .....  | <b>11</b>   |
| <b>3</b>  | <b>Terms and definitions</b> .....   | <b>12</b>   |
| <b>4</b>  | <b>Symbols and abbreviated terms</b> .....                                       | <b>14</b>   |
| 4.1   | Symbols .....  | 14          |
| 4.2   | Abbreviated terms .....  | 16          |
| <b>5</b>  | <b>Pipes at the “M” stage</b> .....  | <b>16</b>   |
| 5.1   | Materials .....  | 16          |
| 5.2   | General characteristics .....  | 18          |
| 5.3   | Material characteristics .....   | 18          |
| 5.4   | Geometric characteristics .....  | 18          |
| 5.5   | Mechanical characteristics .....   | 19          |
| 5.6   | Physical characteristics .....   | 19          |
| 5.7   | Joining .....  | 19          |
| 5.8   | Marking .....  | 19          |
| <b>6</b>  | <b>Fittings at the “M” stage</b> .....   | <b>19</b>   |
| 6.1   | Materials .....  | 19          |
| 6.2   | General characteristics .....  | 20          |
| 6.3   | Material characteristics .....   | 20          |
| 6.4   | Geometric characteristics .....  | 20          |
| 6.5   | Mechanical characteristics .....   | 21          |
| 6.6   | Physical characteristics .....   | 21          |
| 6.7   | Joining .....  | 21          |
| 6.8   | Marking .....  | 21          |
| <b>7</b>  | <b>Ancillary components</b> .....  | <b>21</b>   |
| <b>8</b>  | <b>Fitness for purpose of the installed lining system at the “I” stage</b> ..... | <b>21</b>   |
| 8.1   | Materials .....  | 21          |
| 8.2   | General characteristics .....  | 22          |
| 8.3   | Material characteristics .....   | 22          |
| 8.4   | Geometric characteristics .....  | 22          |
| 8.4.1   | General .....  | 22          |
| 8.4.2   | CIPP wall structure .....  | 22          |
| 8.4.3   | Wall thickness .....   | 22          |
| 8.5   | Mechanical characteristics .....   | 23          |
| 8.5.1   | Reference conditions for testing .....   | 23          |
| 8.5.2   | Test requirements .....  | 23          |

|          |   |           |
|----------|---|-----------|
| 8.6      | Physical characteristics .....  | 25        |
| 8.7      | Additional characteristics.....   | 25        |
| 8.8      | Sampling.....   | 26        |
| <b>9</b> | <b>Installation practice.....</b>   | <b>27</b> |
| 9.1      | Preparatory work.....   | 27        |
| 9.2      | Storage, handling and transport of pipe components.....   | 27        |
| 9.3      | Equipment.....  | 27        |
| 9.4      | Installation.....   | 27        |
|          | 9.4.1 Environmental precautions.....  | 27        |
|          | 9.4.2 Installation procedures.....  | 27        |
|          | 9.4.3 Simulated installations.....  | 28        |
| 9.5      | Process-related inspection and testing.....   | 28        |
| 9.6      | Lining termination.....   | 28        |
| 9.7      | Reconnections to existing pipeline system.....  | 29        |
| 9.8      | Final inspection and testing.....   | 29        |
| 9.9      | Documentation .....   | 29        |
|          | <b>Annex A (informative) CIPP components and their functions .....</b>  | <b>30</b> |
|          | <b>Annex B (normative) Cured-in-place pipes — Determination of short-term flexural properties.....</b>  | <b>31</b> |
|          | <b>Annex C (normative) Cured-in-place pipes — Determination of long-term flexural modulus under dry or wet conditions.....</b>                                  | <b>41</b> |
|          | <b>Annex D (normative) Cured-in-place pipes — Determination of long-term flexural strength under dry, wet or acidic conditions (stress corrosion test).....</b> | <b>46</b> |
|          | <b>Bibliography.....</b>  | <b>50</b> |