

## Guidelines for the determination of the long-term strength of geosynthetics for soil reinforcement

---

Contents	Page
<b>Foreword .....</b>	<b>iv</b>
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms, definitions, abbreviated terms and symbols .....</b>	<b>1</b>
<b>3.1 Terms and definitions .....</b>	<b>1</b>
<b>3.2 Abbreviated terms .....</b>	<b>2</b>
<b>3.3 Symbols .....</b>	<b>3</b>
<b>4 Design procedure .....</b>	<b>4</b>
<b>4.1 Introduction .....</b>	<b>4</b>
<b>4.2 Design lifetime .....</b>	<b>4</b>
<b>4.3 Causes of degradation .....</b>	<b>5</b>
<b>4.4 Design temperature .....</b>	<b>5</b>
<b>5 Determination of long-term (creep) strain .....</b>	<b>5</b>
<b>5.1 Introduction .....</b>	<b>5</b>
<b>5.2 Extrapolation .....</b>	<b>6</b>
<b>5.3 Time-temperature superposition methods .....</b>	<b>6</b>
<b>5.4 Isochronous curves .....</b>	<b>7</b>
<b>5.5 Weathering, chemical and biological effects .....</b>	<b>8</b>
<b>6 Determination of long-term strength .....</b>	<b>8</b>
<b>6.1 Tensile strength .....</b>	<b>8</b>
<b>6.2 Reduction factors .....</b>	<b>8</b>
<b>6.3 Modes of degradation .....</b>	<b>8</b>
<b>7 Creep rupture .....</b>	<b>9</b>
<b>7.1 Introduction .....</b>	<b>9</b>
<b>7.2 Measurement of creep rupture: conventional method .....</b>	<b>10</b>
<b>7.3 Curve fitting (conventional method) .....</b>	<b>11</b>
<b>7.4 Curve fitting for time-temperature block shifting of rupture curves .....</b>	<b>12</b>
<b>7.5 Strain shifting and the stepped isothermal method .....</b>	<b>13</b>
<b>7.6 Extrapolation and definition of reduction factor or lifetime .....</b>	<b>15</b>
<b>7.7 Residual strength .....</b>	<b>15</b>
<b>7.8 Reporting of results .....</b>	<b>15</b>
<b>7.9 Procedure in the absence of sufficient data .....</b>	<b>15</b>
<b>8 Installation damage .....</b>	<b>16</b>
<b>8.1 General .....</b>	<b>16</b>
<b>8.2 Data recommended .....</b>	<b>16</b>
<b>8.3 Calculation of reduction factor .....</b>	<b>17</b>
<b>8.4 Procedure in the absence of direct data .....</b>	<b>17</b>
<b>9 Weathering, chemical and biological degradation .....</b>	<b>19</b>
<b>9.1 Introduction .....</b>	<b>19</b>
<b>9.2 Data recommended for assessment .....</b>	<b>19</b>
<b>9.3 Weathering .....</b>	<b>19</b>
<b>9.4 Chemical degradation .....</b>	<b>20</b>

9.5	<b>Biological degradation .....</b>	28
10	<b>Determination of long-term strength .....</b>	28
10.1	<b>Factor of safety <math>f_s</math> .....</b>	28
10.2	<b>Design for residual strength .....</b>	29
11	<b>Reporting .....</b>	29
	<b>Bibliography .....</b>	30