

# DIN 4871:2022-09 (E)

## Non-destructive testing - Qualification of NDT personnel in Civil Engineering (NDT-CE)

---

Contents	Page
<b>Foreword .....</b>	<b>4</b>
<b>Introduction .....</b>	<b>5</b>
<b>1 Scope .....</b>	<b>6</b>
<b>2 Normative references .....</b>	<b>6</b>
<b>3 Terms and definitions .....</b>	<b>6</b>
<b>4 Responsibilities .....</b>	<b>9</b>
<b>4.1 Employer .....</b>	<b>9</b>
<b>4.2 Examination centre .....</b>	<b>9</b>
<b>4.3 Examiner .....</b>	<b>10</b>
<b>5 Levels of qualification .....</b>	<b>10</b>
<b>5.1 NDT-CE Level 1 -- Measurement .....</b>	<b>10</b>
<b>5.2 NDT-CE Level 2 -- Evaluation and inspection supervision .....</b>	<b>10</b>
<b>6 Eligibility .....</b>	<b>11</b>
<b>6.1 General .....</b>	<b>11</b>
<b>6.2 Prior knowledge .....</b>	<b>11</b>
<b>6.3 Practical experience .....</b>	<b>11</b>
<b>6.4 Requirements on visual acuity .....</b>	<b>12</b>
<b>7 Training .....</b>	<b>12</b>
<b>7.1 General .....</b>	<b>12</b>
<b>7.2 Training times .....</b>	<b>12</b>
<b>7.3 Basic modules .....</b>	<b>13</b>
<b>8 Qualification examination .....</b>	<b>13</b>
<b>8.1 General .....</b>	<b>13</b>
<b>8.2 Theoretical qualification examination .....</b>	<b>13</b>
<b>8.3 Practical qualification examination .....</b>	<b>14</b>
<b>8.4 Carrying out the qualification examinations .....</b>	<b>14</b>
<b>8.5 Repeat examinations .....</b>	<b>15</b>
<b>8.6 Assessing qualification examinations .....</b>	<b>15</b>
<b>9 Transition period .....</b>	<b>15</b>
<b>Annex A (normative) Theoretical NDT-CE training content for the method modules .....</b>	<b>17</b>
<b>A.1 Rebound hammer .....</b>	<b>17</b>
<b>A.2 Magneto-inductive methods .....</b>	<b>19</b>
<b>A.3 Potential mapping .....</b>	<b>21</b>
<b>A.4 Ground penetrating radar .....</b>	<b>24</b>
<b>A.5 Ultrasonics .....</b>	<b>26</b>
<b>A.6 Impact echo .....</b>	<b>29</b>
<b>Annex B (normative) Theoretical NDT-CE training content for the inspection task modules .....</b>	<b>32</b>

B.1	Verification of compressive strength .....	32
B.2	Verification of reinforcement .....	35
<b>Annex C (normative) Theoretical NDT-CE training content for the basic modules .....</b>		<b>38</b>
C.1	Overview of NDT-CE methods .....	38
C.2	Measurement technology .....	39
C.3	Wave theory and fundamentals of physics .....	40
C.4	Damage mechanisms and specifics of construction .....	41
C.5	Quality assurance .....	41
C.6	Combinations of methods .....	42
<b>Annex D (informative) Practical NDT-CE training content for method and inspection task modules .</b>		<b>44</b>
D.1	Rebound hammer .....	44
D.2	Magneto-inductive methods .....	45
D.3	Potential mapping .....	46
D.4	Ground penetrating radar .....	46
D.5	Ultrasonics .....	47
D.6	Impact echo .....	48
D.7	Verification of compressive strength .....	49
D.8	Verification of reinforcement .....	50
<b>Bibliography .....</b>		<b>52</b>

## Figures

<b>Figure 1 — Structure of specified content.....</b>	<b>6</b>
---	----------

## Tables

<b>Table 1 — Minimum required practical experience .....</b>	<b>11</b>
<b>Table 2 — Minimum requirements for training .....</b>	<b>12</b>
<b>Table 3 — Minimum training requirements for the basic modules NDT-CE Level 2.....</b>	<b>13</b>
<b>Table 4 — Minimum required number of questions — Theoretical qualification examination.....</b>	<b>13</b>
<b>Table 5 — Topics and weighting factors — Assessment of the practical examination.....</b>	<b>15</b>