

# DIN ISO 7870-2:2021-04 (E)

## Control charts - Part 2: Shewhart control charts (ISO 7870-2:2013)

---

<b>Contents</b>		<b>Page</b>
National foreword .....		4
National Annex NA (informative) Bibliography .....		6
Foreword .....		7
Introduction .....		8
<b>1</b>	<b>Scope .....</b>	<b>9</b>
<b>2</b>	<b>Normative references .....</b>	<b>9</b>
<b>3</b>	<b>Terms, definitions and symbols .....</b>	<b>9</b>
<b>3.1</b>	<b>General .....</b>	<b>9</b>
<b>3.2</b>	<b>Symbols .....</b>	<b>9</b>
<b>4</b>	<b>Nature of Shewhart control charts .....</b>	<b>11</b>
<b>5</b>	<b>Types of control charts .....</b>	<b>13</b>
<b>5.1</b>	<b>Control charts where no pre-specified values are given .....</b>	<b>13</b>
<b>5.2</b>	<b>Control charts with respect to given pre-specified values .....</b>	<b>14</b>
<b>5.3</b>	<b>Types of variables and attributes control charts .....</b>	<b>14</b>
<b>6</b>	<b>Variables control charts .....</b>	<b>15</b>
<b>6.1</b>	<b>Mean ( <math>\bar{X}</math> ) chart and range (R) chart or mean ( <math>\bar{X}</math> ) chart and standard deviation (s) chart ..</b>	<b>16</b>
<b>6.2</b>	<b>Control chart for individuals (X) and control chart for moving ranges (Rm) .....</b>	<b>17</b>
<b>6.3</b>	<b>Control charts for medians ( <math>\bar{X}</math> ) .....</b>	<b>18</b>
<b>7</b>	<b>Control procedure and interpretation for variables control charts .....</b>	<b>19</b>
<b>7.1</b>	<b>Collect preliminary data .....</b>	<b>19</b>
<b>7.2</b>	<b>Examine the s (or R) chart .....</b>	<b>19</b>
<b>7.3</b>	<b>Remove assignable causes and revise the chart .....</b>	<b>19</b>
<b>7.4</b>	<b>Examine the X chart .....</b>	<b>20</b>
<b>7.5</b>	<b>Ongoing monitoring of process .....</b>	<b>20</b>
<b>8</b>	<b>Pattern tests for assignable causes of variation .....</b>	<b>20</b>
<b>9</b>	<b>Process control, process capability, and process improvement .....</b>	<b>21</b>
<b>10</b>	<b>Attributes control charts .....</b>	<b>23</b>
<b>11</b>	<b>Preliminary considerations before starting a control chart .....</b>	<b>25</b>
<b>11.1</b>	<b>Choice of critical to quality (CTQ) characteristics describing the process to control .....</b>	<b>25</b>
<b>11.2</b>	<b>Analysis of the process .....</b>	<b>25</b>
<b>11.3</b>	<b>Choice of rational subgroups .....</b>	<b>25</b>
<b>11.4</b>	<b>Frequency and size of subgroups .....</b>	<b>26</b>
<b>11.5</b>	<b>Preliminary data collection .....</b>	<b>26</b>
<b>11.6</b>	<b>Out of control action plan .....</b>	<b>26</b>
<b>12</b>	<b>Steps in the construction of control charts .....</b>	<b>26</b>
<b>12.1</b>	<b>Determine data collection strategy .....</b>	<b>27</b>
<b>12.2</b>	<b>Data collection and computation .....</b>	<b>28</b>

12.3	Plotting X chart and R chart .....	28
DIN ISO 7870-2:2021-04 13 Caution with Shewhart control charts .....		28
13.1	General caution .....	29
13.2	Correlated data .....	30
13.3	Use of alternative rule to the three-sigma rule .....	30
Annex A (informative) Illustrative examples .....		32
Annex B (informative) Practical notices on the pattern tests for assignable causes of variation .....		50
Bibliography .....		52