

# DIN EN 15734-1:2013-09 (E)

## Railway applications - Braking systems of high speed trains - Part 1: Requirements and definitions (includes Corrigendum :2013)

---

<b>Contents</b>		<b>Page</b>
<b>1</b>	<b>Scope .....</b>	<b>5</b>
<b>2</b>	<b>Normative references .....</b>	<b>5</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>7</b>
<b>4</b>	<b>Symbols, units and abbreviations .....</b>	<b>8</b>
<b>5</b>	<b>Design principles .....</b>	<b>9</b>
<b>5.1</b>	<b>General requirements .....</b>	<b>9</b>
<b>5.1.1</b>	<b>Safety .....</b>	<b>9</b>
<b>5.1.2</b>	<b>Fire protection .....</b>	<b>11</b>
<b>5.1.3</b>	<b>Reliability and availability .....</b>	<b>11</b>
<b>5.1.4</b>	<b>Environmental condition .....</b>	<b>11</b>
<b>5.1.5</b>	<b>Train configuration .....</b>	<b>12</b>
<b>5.1.6</b>	<b>Maximum speed and line parameters .....</b>	<b>12</b>
<b>5.1.7</b>	<b>Coupling compatibility/capability .....</b>	<b>12</b>
<b>5.1.8</b>	<b>Longitudinal track forces .....</b>	<b>13</b>
<b>5.1.9</b>	<b>EMC .....</b>	<b>13</b>
<b>5.1.10</b>	<b>Operation in very long tunnels .....</b>	<b>13</b>
<b>5.2</b>	<b>Applicable brakes .....</b>	<b>13</b>
<b>5.2.1</b>	<b>Basic architecture for high speed braking .....</b>	<b>13</b>
<b>5.2.2</b>	<b>Dynamic brakes .....</b>	<b>13</b>
<b>5.2.3</b>	<b>Friction brakes .....</b>	<b>14</b>
<b>5.2.4</b>	<b>Magnetic track brakes .....</b>	<b>14</b>
<b>5.2.5</b>	<b>Non conventional brakes .....</b>	<b>14</b>
<b>5.3</b>	<b>Dynamic brakes .....</b>	<b>14</b>
<b>5.3.1</b>	<b>General aspect .....</b>	<b>14</b>
<b>5.3.2</b>	<b>Electro-dynamic brake (depending on the catenary in function) .....</b>	<b>15</b>
<b>5.3.3</b>	<b>Rheostatic brake .....</b>	<b>16</b>
<b>5.3.4</b>	<b>Control Command of the electro-dynamic brakes .....</b>	<b>16</b>
<b>5.3.5</b>	<b>Brake resistors .....</b>	<b>16</b>
<b>5.3.6</b>	<b>Hydrodynamic brake .....</b>	<b>17</b>
<b>5.4</b>	<b>Friction brake .....</b>	<b>17</b>
<b>5.4.1</b>	<b>General .....</b>	<b>17</b>
<b>5.4.2</b>	<b>Control command .....</b>	<b>17</b>
<b>5.4.3</b>	<b>Installation of the brake equipment .....</b>	<b>18</b>
<b>5.4.4</b>	<b>Leakage .....</b>	<b>19</b>
<b>5.4.5</b>	<b>Mechanical components/bogie equipment .....</b>	<b>19</b>
<b>5.5</b>	<b>Eddy current brake .....</b>	<b>21</b>
<b>5.6</b>	<b>Magnetic track brake .....</b>	<b>23</b>
<b>5.7</b>	<b>Non conventional brakes .....</b>	<b>23</b>
<b>5.8</b>	<b>Emergency brake concept .....</b>	<b>23</b>
<b>5.8.1</b>	<b>General .....</b>	<b>23</b>
<b>5.8.2</b>	<b>General architecture .....</b>	<b>24</b>
<b>5.8.3</b>	<b>Demand phase .....</b>	<b>24</b>
<b>5.8.4</b>	<b>Collecting and distributing brake command signals .....</b>	<b>27</b>
<b>5.9</b>	<b>Service braking .....</b>	<b>28</b>
<b>5.9.1</b>	<b>Brake management - Brake blending .....</b>	<b>28</b>
<b>5.9.2</b>	<b>Brake command .....</b>	<b>29</b>
<b>5.9.3</b>	<b>Signal processing .....</b>	<b>30</b>

5.9.4	ATC Automatic train control system (optional)	31
5.9.5	Combined braking with two brake handles	32
5.9.6	Jerk / Ramps	32
5.9.7	Coupling/Decoupling	32
5.10	Wheel slide protection and locked wheel detection	32
5.10.1	General	32
5.10.2	Wheel slide protection	32
5.10.3	Locked wheel monitoring system	34
5.11	Parking brake	34
5.12	Location of the control devices	36
5.12.1	Driver's cab	36
5.12.2	Operating devices others than in the cab	37
5.13	Brake indicators	38
5.14	Fault monitoring and diagnostics	39
5.15	Driver's brake test	41
5.15.1	General	41
5.15.2	Regular basic brake test	41
5.15.3	Full brake test	42
5.15.4	Realisation of brake tests	43
5.16	Power supply	43
5.16.1	Air pressure supply	43
5.16.2	Electrical energy supply	44
5.17	Enhancement of wheel-rail adhesion	44
5.18	Maintenance	45
6	Brake performance	45
6.1	General	45
6.2	Emergency braking	46
6.2.1	General	46
6.3	Service braking	46
6.4	Thermal requirements	47
6.5	Adhesion values	47
Annex A (informative) Passenger alarm system		49
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC		50
Bibliography		52