

# DIN EN 13232-9:2006-08 (E)

## Railway applications - Track - Switches and crossings - Part 9: Layouts

---

<b>Contents</b>		<b>Page</b>
Foreword .....		4
1	Scope .....	6
2	Normative references .....	6
3	Terms and definitions .....	7
4	General design process .....	11
4.1	General process .....	11
4.2	Design step details .....	12
4.3	Practical use of the design process .....	12
5	General design (design step 1) .....	14
5.1	Track layout .....	14
5.2	Geometrical design .....	14
5.2.1	Inputs .....	14
5.2.2	Rules .....	14
5.2.3	Geometry plan .....	14
5.3	Wheel rail interaction .....	15
5.3.1	Inputs .....	15
5.3.2	Rules .....	15
5.3.3	Output .....	22
6	Main constructional design (step 2) .....	42
6.1	Inputs .....	42
6.2	Structural requirements .....	43
6.2.1	General .....	43
6.2.2	General requirements .....	43
6.2.3	Specific requirements .....	43
6.2.4	Other requirements .....	45
6.3	Actuation, locking and detection design .....	46
6.4	Output - main construction documents .....	46
6.4.1	Geometry .....	46
6.4.2	Guidance .....	46
6.4.3	Actuation .....	46
6.4.4	Constructional .....	47
6.4.5	Information lists .....	47
7	Detailed component design (step 3) .....	47
7.1	Switches .....	47
7.2	Crossings .....	47
7.3	Expansion devices .....	47
7.4	Other components .....	48
7.5	Output - assembly documents .....	48
7.5.1	Main assembly documents .....	48
7.5.2	Optional documents .....	50
8	Acceptance (step 4) .....	50
8.1	Inputs .....	50
8.1.1	Documents and plans .....	50
8.1.2	Limits of supply .....	50

8.2	Acceptance testing .....	50
8.2.1	Components acceptance .....	50
8.2.2	Layout assembly acceptance .....	51
8.3	Outputs .....	55
8.3.1	Documents .....	55
8.3.2	Traceability .....	55
8.3.3	Markings .....	55
<b>Annex A (informative) Design criteria .....</b>		<b>56</b>
A.1	Geometry design .....	56
A.2	Wheel rail interaction .....	58
A.3	Actuation, locking and detection conformity .....	60
A.4	Switch design .....	62
A.5	Crossing design (with fixed parts) .....	64
A.6	Crossing design (with moveable parts) .....	66
A.7	Expansion devices .....	68
<b>Annex B (informative) Layout acceptance form .....</b>		<b>69</b>
B.1	Justification .....	69
B.2	Example of layout acceptance form .....	70
<b>Annex C (informative) Functional and safety dimensions, practically used by different European Networks .....</b>		<b>72</b>
<b>Annex D (normative) Maximum angle of attack in obtuse crossings .....</b>		<b>73</b>
<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 96/48/EC of 23 July 1996 on the interoperability of the trans-European high-speed rail system amended by Directive 2004/50/EC of 29 April 2004 .....</b>		<b>75</b>
<b>Bibliography .....</b>		<b>77</b>