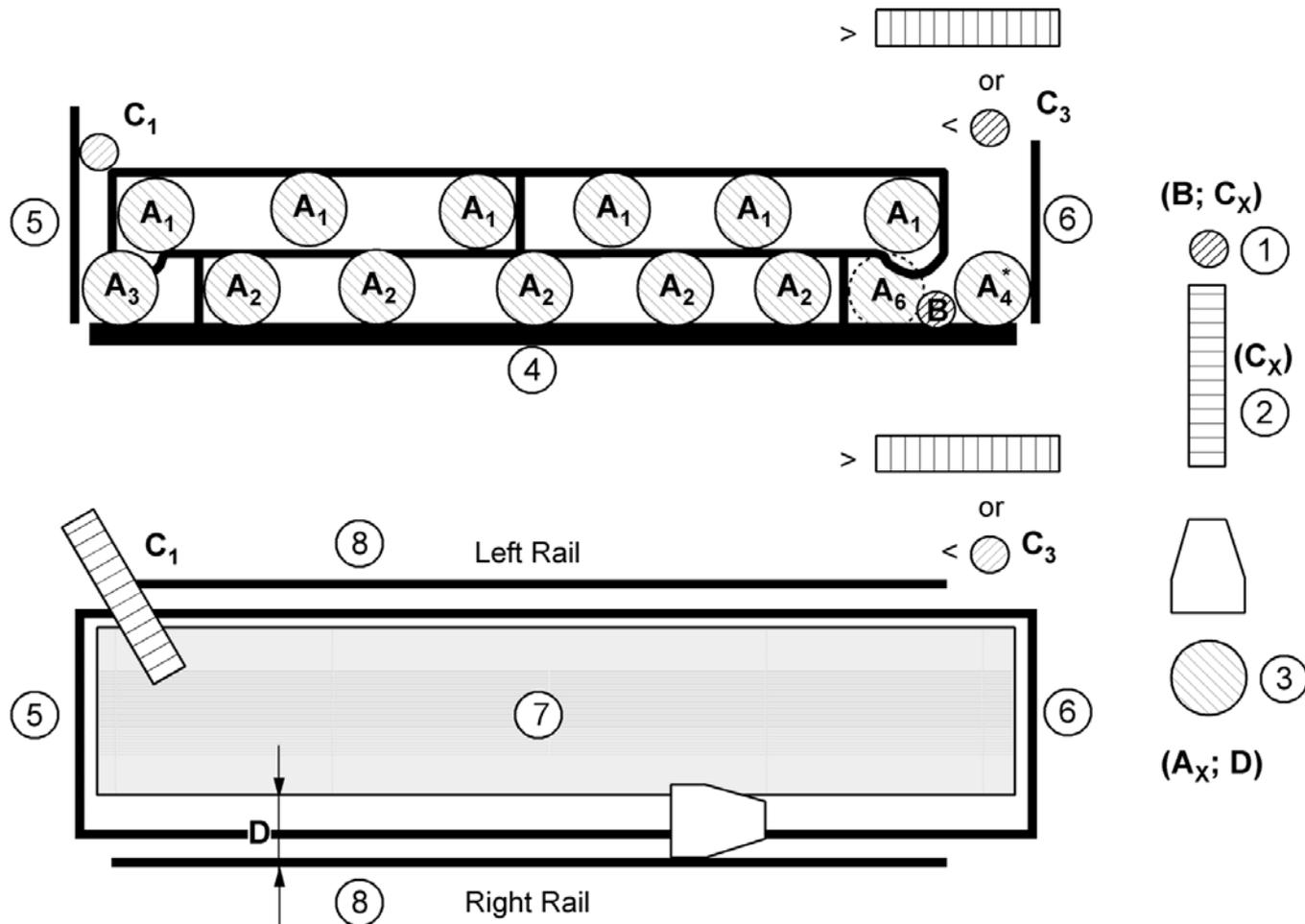


### Appendix 3 - BS EN Dimensional requirements (BS EN 60601-2-52:2010) – from April 2013

Dimensional requirements of bed rails (from BS EN 60601-2-52:2010) – replacing BS EN 1970:2000 from 01/04/2013



Only applies when the area C is < 60 mm.

**Key**

- 1 Area of TOOL representing neck diameter (60 mm).
- 2 Area of TOOL representing chest breadth (318 mm).
- 3 Area of TOOL representing head breadth (120 mm).
- 4 MATTRESS SUPPORT PLATFORM
- 5 HEAD BOARD
- 6 FOOT BOARD
- 7 Mattress
- 8 SIDE RAIL

Area	Description	Requirement / Compliance method

A1	Fully enclosed openings within a SIDE RAIL, HEAD or FOOT BOARD	Gap is specified to be less than 120 mm as defined by the following test.
A2	Fully enclosed opening defined by the SIDE RAIL, its supports, and the MATTRESS SUPPORT PLATFORM	<i>Compliance is checked by the following test:</i>
A3	Partially enclosed opening defined by the HEADBOARD, MATTRESS SUPPORT PLATFORM, and SIDE RAIL	<i>Except for A3 articulate the MEDICAL BED and find the largest opening. Insert 60 mm diameter part of cone tool (see Figure 201.103a, See Figures 201.107 and 201.108) through opening from inside of the MEDICAL BED system. Bring cone tool to bear on opening of interest. Exert 250 N force applied to 60 mm cylindrical end of cone tool in most disadvantageous direction.</i>
A4	Partially enclosed opening defined by the FOOT BOARD, MATTRESS SUPPORT PLATFORM, and SIDE RAIL (except where the gap between the SIDE RAIL and the FOOT BOARD > 318 mm)	
A5	Partially enclosed opening between segmented or split SIDE RAILS and the MATTRESS SUPPORT PLATFORM (except where the gap between the SIDE RAILS is > 318 mm)	Pass/fail criterion: Opening shall not allow 120 mm diameter part of cone tool to enter and pass through.
A6	Partially enclosed opening defined by the lowest point of a SIDE RAIL, the adjacent SIDE RAIL support, and MATTRESS SUPPORT PLATFORM, to the outside of the SIDE RAIL supports.	
A	Other opening(s) defined by ACCESSORIES (e.g., IV poles, fracture frames) and SIDE RAILS, HEAD/FOOT BOARDS, and/or MATTRESS SUPPORT PLATFORM. This is not in Figure 201.107 and Figure 201.108 as it	
B	Distance between the MATTRESS SUPPORT PLATFORM and the lowest point of the SIDE RAIL outside of the SIDE RAIL support.  <b>AND</b>  The angle between SIDE RAIL and the MATTRESS SUPPORT PLATFORM at the range of the mattress height defined by the MANUFACTURER +/-2 cm.  NOTE +/-2 cm takes into account mattress compression and height of the neck above the mattress.	Gap < 60 mm.  <b>AND</b>  Angle between MATTRESS SUPPORT PLATFORM and the SIDE RAIL interface >60° over the entire range of mattress heights from the minimum recommended mattress height, minus 2 cm. to the maximum recommended mattress height, plus 2 cm.  NOTE The RISK MANAGEMENT has to address the possibility of the use of a mattress not specified by the MANUFACTURER.  RISK MANAGEMENT to address the entrapment condition of area B (as illustrated in Figure AA.13) should be performed, taking the following into consideration: i) The SIDE RAIL shape and geometry. ii) The distance between the lowest point of the SIDE RAIL and the MATTRESS SUPPORT PLATFORM. iii) The mattress material properties. iv) The mattress dimensions. v) The fit relationship between the SIDE RAIL, mattress and MATTRESS SUPPORT PLATFORM.  <i>Compliance is checked by inspection of the RISK MANAGEMENT FILE. See also Annex CC for further information.</i>

C1	Gap between the HEAD BOARD and adjacent SIDE RAIL.	<p>Gap between the HEAD BOARD and adjacent SIDE RAIL is required to be &lt;60 mm.</p> <p>Compliance for a gap &lt;60 mm is checked by the following test:</p> <p><i>The cylinder tool (see Figure 201.103b) shall be oriented parallel to floor, in the most disadvantageous angle in the horizontal plane above the gap. The 60 mm cylinder tool shall rest with the full weight on the gap where the cylinder tool intersects. Extra vertical force shall not be used. The cylinder tool shall not be used to pry apart parts of the MEDICAL BED.</i></p> <p><i>Pass/fail criterion:</i> The 60 mm cylinder tool shall not slide into the opening. See Annex CC for further clarification.</p> <p><b>SEE ALSO ANNEX CC FOR FURTHER INFORMATION.</b></p>
C2	Gap between segmented or split SIDE RAILS with both SIDE RAILS raised.	<p>Gap between segmented or split SIDE RAILS with both SIDE RAILS raised is required to be &lt; 60 mm or &gt; 318 mm.</p> <p>Compliance for a gap &lt; 60 mm is checked by the following test:</p> <p><i>The cylinder tool (see Figure 201.103b) shall be oriented parallel to floor, in the most disadvantageous angle in the horizontal plane above the gap. The 60 mm cylinder tool shall rest with the full weight on the gap where the cylinder intersects. Extra vertical force shall not be used. The cylinder tool shall not be used to pry apart parts of the MEDICAL BED.</i></p> <p><i>For MEDICAL BED with split SIDE RAILS, articulate the MATTRESS SUPPORT PLATFORM to identify the worst case opening between the SIDE RAILS and perform the test.</i></p> <p><i>Pass/fail criterion:</i> The 60 mm cylinder tool shall not slide into the opening. See Annex CC for further clarification.</p> <p><b>OR</b></p> <p>For a gap &gt; 318 mm: The gap shall be &gt; 318 mm for the entire vertical distance.</p> <p><b>See Annex CC for further information.</b></p>
C3	Gap between SIDE RAIL and FOOTBOARD. Other openings(s) defined by ACCESSORIES (e.g. IV poles, fractures frames,.....) and SIDE RAILS, HEAD BOARD, FOOT BOARD, and / or MATTRESS SUPPORT PLATFORM.	<p>Gap between SIDE RAIL and FOOTBOARD is required to be &lt; 60 mm OR &gt; 318 mm.</p> <p>Compliance for a gap &lt; 60 mm is checked by the following test:</p> <p><i>The cylinder tool (see Figure 201.103b) shall be oriented parallel to floor, in the most disadvantageous angle in the</i></p>

		<p><i>horizontal plane above the gap. The 60 mm cylinder tool shall rest with the full weight on gap where the cylinder intersects. Extra vertical force shall not be used. The cylinder tool shall not be used to pry apart parts of the MEDICAL BED.</i></p> <p><i>Pass/fail criterion: The 60 mm cylinder tool shall not slide into the opening. See Annex CC for further clarification.</i></p> <p><b>OR</b></p> <p>For a gap &gt; 318 mm: The gap shall be &gt; 318 mm for the entire vertical distance.</p> <p><b>SEE ANNEX CC FOR FURTHER INFORMATION.</b></p>
<p><b>D</b></p>	<p>Region defined between the SIDE RAIL and the mattress.</p>	<p><i>Compliance is checked by the following test: Push the mattress away from the SIDE RAIL being measured until the mattress retention system, or the opposing SIDE RAIL stops the mattress. Pull outward on the SIDE RAIL to remove any lateral play and during application of the force the cone tool (see Figure 201.103a) is placed with its longitudinal axis parallel to the SIDE RAIL, resting on the mattress in the horizontal gap between the SIDE RAIL and mattress. Turn the cone tool until the line on the face of the 120 mm diameter end is horizontal. Let the cone tool sink into the space by its own weight.</i></p> <p><i>If a mattress retention system, SIDE RAIL support or other structure keeps the cone tool from sinking in the gap, the cone tool shall be placed at a different location along the SIDE RAIL where there is no interference.</i></p> <p><i>Pass/fail criterion: The large end of the cone tool shall not sink below the mattress surface by 50 % or more of its 120 mm diameter.</i></p> <p>NOTE The gap between HEADBOARD and MATTRESS SUPPORT PLATFORM is covered by the measurement of A (See designator A: other opening(s) defined by ACCESSORIES (e.g., IV poles, fracture frames) and SIDE RAILS, HEAD/FOOT BOARDS, and/or MATTRESS SUPPORT PLATFORM. This is not in Figure 201.107 or Figure 201.108 as it depends on the construction of the MEDICAL BED) Gap between HEADBOARD and top of mattress:</p> <p>The mattresses specified by the MANUFACTURER normally have no reasonable gaps between HEADBOARD and top end of mattresses for a possible head</p>

		entrapment.
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