
Orthopaedic beds — Specification



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Orthopaedic beds — Specification

1 Scope

This standard specifies the material, dimensional, and constructional requirements for beds intended for orthopaedic patients.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CD-ARS 2061, Patients' trolleys — Specification

3 Terms and definitions

For the purpose of this standard the following definitions apply.

3.1

acceptable

recognised to the relevant administering this standard, or to the parties concluding the purchase contract, as relevant

3.2

bright polished finish

bright reflective finish obtained by polishing the surface without completely obliterating grinding marks or other surface texture

3.3

directional satin finish

finish obtained by so grinding the surface with fine abrasive (without subsequent polishing) as to leave a silky appearance, with all the abrasion marks running in the same direction

4 Requirements

4.1 Material

4.1.1 Rolled steel sections and plate

Rolled steel sections and plate shall be of a good quality mild steel, and shall be free from cracks, fins, laminations, and other defects

4.1.2 Mild steel tubes

Mild steel tubes shall comply with the relevant requirements in Table 1.

Table 1: Grade and Mechanical properties for tube

Grade	Minimum yield strength, (R_{eH}), MPa	Minimum ultimate tensile strength, MPa
275	275	410
355	350	450

DARS 2146:2024

4.1.3 Stainless steel

Stainless steel used shall be of AISI Type 304 stainless steel, or other acceptable austenitic stainless steel of weldable quality.

4.1.4 Castors

Castors shall be of size at least 125 mm and shall comply with the appropriate requirements of ISO 22883. Each castor shall have an acceptable wheel-locking and a built-in directional swivel-locking device.

4.1.5 Paint

The paint used shall be an enamel or a system comprising a primer and an enamel (applicable to mild steel products).

4.1.6 Powder coatings

Powder coatings shall be based on a compounded epoxy resin suitable for application by a fluidized bed process or aerostatic spray process (applicable to mild steel products).

4.1.7 Welding electrodes and filler metal

Welding electrodes and filler metal used in fusion welding and braze welding shall be such as will produce a joint complying with the relevant requirements of 4.2.

4.2 Fusion-welded and braze-welded joints

Parts joined by fusion welding and braze welding shall be close fitting and in correct alignment and the joint shall have mechanical properties and, when relevant, corrosion resistance of at least the same order as those of the parent metal. Welds shall be acceptable, and weld faces shall be smooth, clean, and free from porosity, cavities, spatter, and trapped slag. Welds shall merge smoothly into the surface of the parent metal without overlap or undue undercut. The weld metal, heat-affected zone, and adjacent parent metal shall be free from cracks. Even where welding is done from one side only, there shall be full penetration of the joint.

4.3 Design and dimensions

The design shall be similar to the typical design shown in figure 1 and the frame and all associated metal parts shall be of mild steel or stainless steel, as specified by the purchaser. The dimensions shall conform to those in figure 2. In the cases of tubes and rolled sections, nominal mill tolerances shall apply. In all other cases where tolerances are not specified, dimensions shall be subject to a tolerance of ± 5 mm.

The bed shall comprise:

- a) a main frame carrying the mattress seat in six sections (see (d) below);
- b) a head-end, with a manually operated lifting device, resting on two legs with swivel castors, and with a fixed or removable bow, as required by the purchaser;
- c) a foot-end, with a manually operated lifting device, that has a fixed bow resting on two legs with swivel castors;
- d) a mattress seat comprising an adjustable back rest, a fixed centre or buttock section, and two separately adjustable thigh sections each attached to a separately adjustable lower leg section; and
- e) Manually operated devices for adjusting the back rest and thigh sections of the mattress seat.

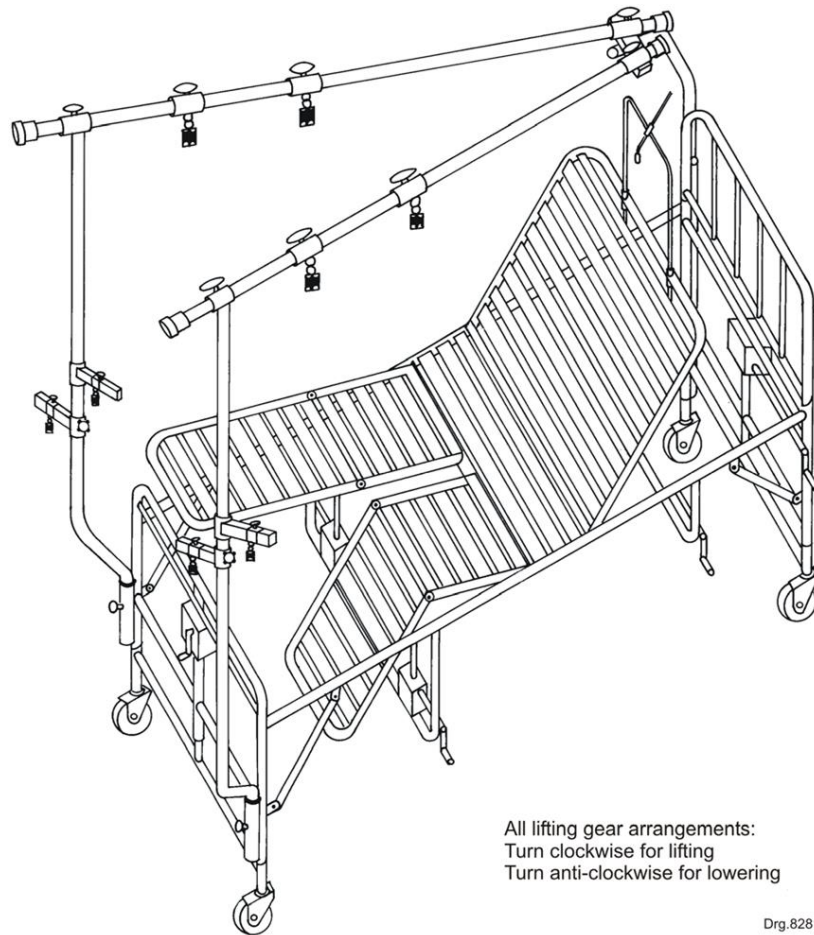


Figure 1 — Orthopaedic bed

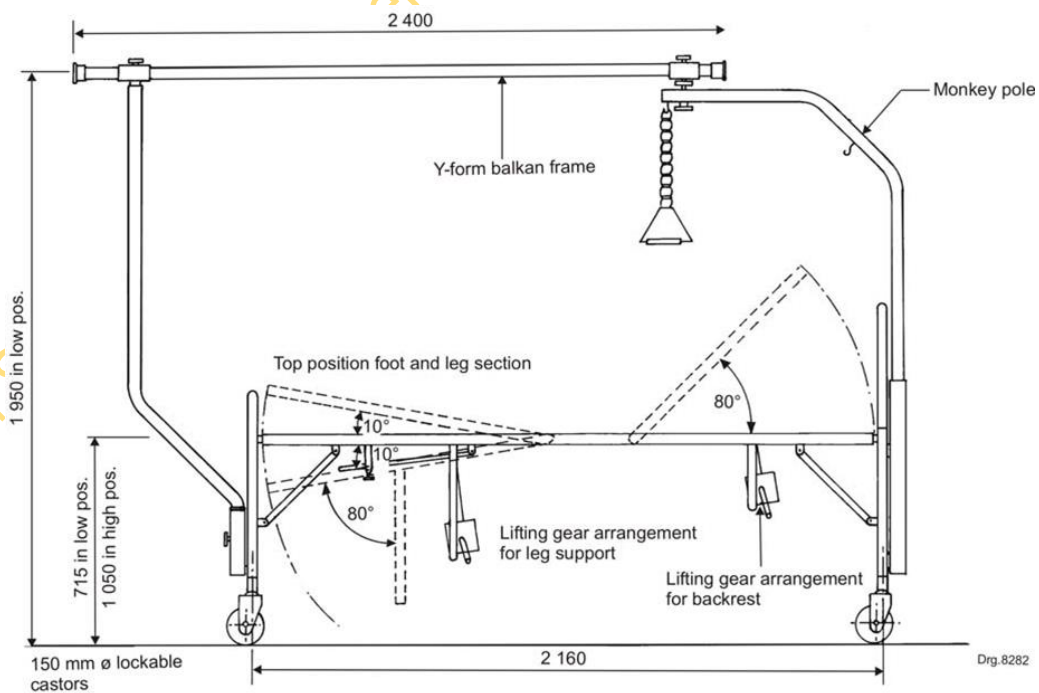


Figure 2 — Dimensions orthopaedic bed

4.4 Main frame

The main frame side rails shall be of tube of nominal outside diameter at least 38 mm and nominal wall thickness at least 2 mm, or of acceptable closed hollow section of at least equal strength and rigidity. The side rails shall be connected (near the head-end) by a transverse brace of angle section having nominal dimensions at least 32 mm x 32 mm x 4,8 mm and (in the positions shown in figure 1) by two additional braces of acceptable section that support the fixed centre section of the mattress seat and to which are attached the hinges of the back rest and leg support sections.

4.5 Bows and legs

4.5.1 Head-end

Except when a removable bow has been specified by the purchaser, the legs and bow shall be made in one piece from tube of nominal outside diameter at least 32 mm and nominal wall thickness at least 1,60 mm. When a removable bow has been specified by the purchaser, it shall be quickly and easily removable from the legs. The head-end bow shall have a horizontal tubular brace of nominal outside diameter at least 25 mm and nominal wall thickness at least 1.60 mm. This brace shall be welded between the side members of the bow at a height above the main frame not exceeding 40 mm.

Four approximately equally spaced vertical tubular filling members of nominal outside diameter at least 16 mm and nominal wall thickness at least 1.60 mm shall be welded between the horizontal part of the bow and the horizontal brace. The head-end shall be secured to the ends of the side rails by means of short snug-fitting mild steel bars that are welded to the legs and bolted to the ends of the side rails of the main frame. Mild steel diagonal flat braces of cross-section at least 20 mm x 5 mm shall be bolted with 6 mm diameter bolts to acceptable lugs that are welded to the legs and the main frame rails. A monkey-pole attachment shall be provided for supporting a balkan frame (see figure 2).

The head-end shall have telescopic legs operated by a bed-lifting device (see 4.6) and carrying swivel castors.

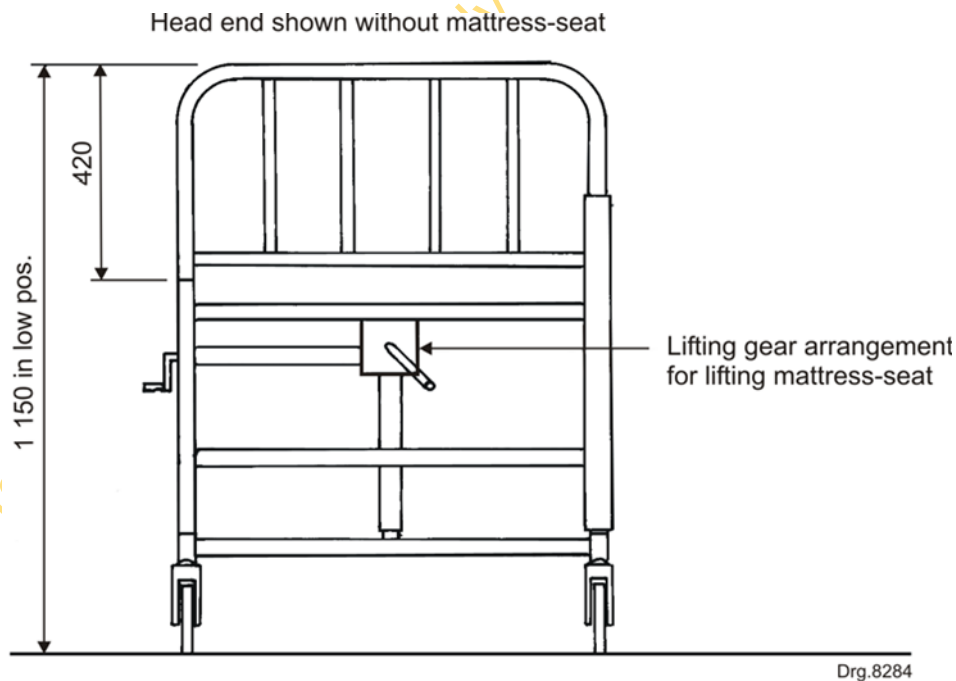


Figure 3 — Head end

4.5.2 Foot-end

The foot-end shall comprise a fixed bow and one pair of telescopic legs carrying swivel castors. The legs and bow shall be made in one piece from steel tube of nominal outside diameter at least 32 mm, and nominal wall thickness at least 1.60 mm.

The foot-end shall be secured and braced to the main frame as described in 4.5.1. The two legs shall have an acceptable system of horizontal tubular braces, welded to the legs, the lowest at a height of at least 250 mm above the floor, and made from tube of nominal outside diameter at least 25 mm and nominal wall thickness at least 1,60 mm. An attachment shall be provided on each leg for carrying a balkan frame (see figures 2 and 4).

The foot-end shall incorporate a bed-lifting device (see 4.6).

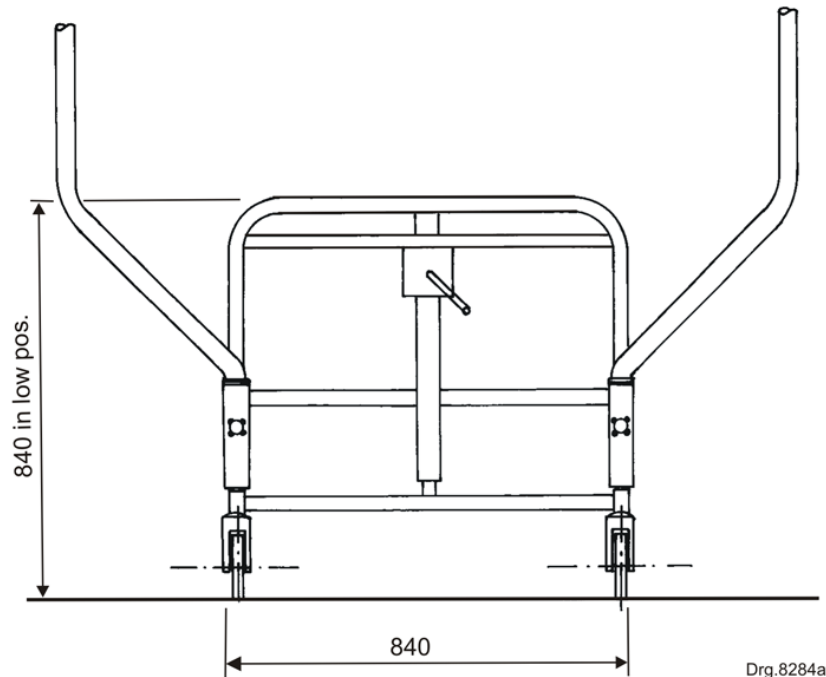


Figure 4 — Foot end

4.6 Bed-lifting device

A built-in lifting mechanism shall be provided at each end of the bed for extending the telescopic legs at that end of the bed and operated by means of a fold-away crank handle through a system of screwed spindles and bevel gears. This lifting mechanism shall be of robust construction and shall be capable of lifting the end of the bed to a height of at least 280 mm above its position when the bed is level.

4.7 Mattress seat

4.7.1 Sub frames

The parts of the mattress seat forming the back rest and the thigh-and-leg sections shall be constructed as sub frames of tube, angle section, or other acceptable steel section, and shall be hinged to be fixed central (buttock) section. Tubular sub frames shall be of tube of nominal outside diameter at least 25 mm and nominal wall thickness at least 1,60 mm. Sub frames constructed of other sections shall be of strength and rigidity at least equal to that of tubular sub frames. The sub frame for the back rest shall be hinged to the central section and shall be capable of adjustment into any desired inclined position above the horizontal, to a maximum of 80°. The central (buttock) section shall be supported on the two central braces between the main side rails of the bed (see 4.4). The sub frame for the thigh-and-leg section shall be hinged to the central section and shall be capable of adjustment into any desired inclined position within

10° above and 10° below the horizontal. There shall be two separately hinged (right and left) lower-leg sections each with its own independent adjustment.

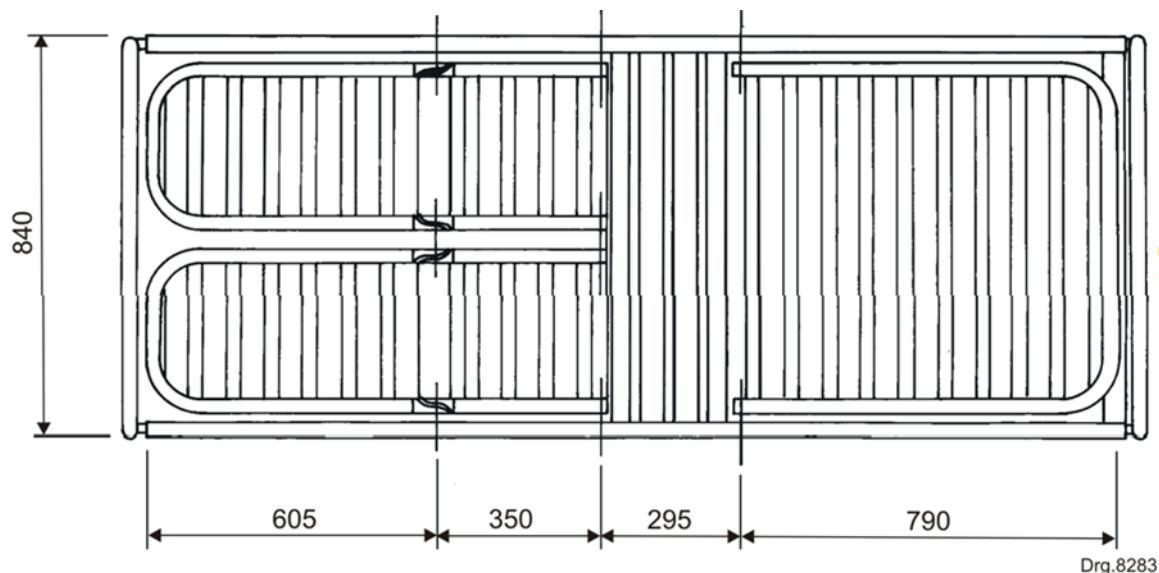


Figure 5 — Mattress seat

4.7.2 Mattress-adjusting devices

The sub frames shall be held in any desired position by struts which shall be adjustable by means of a series of notches, or by the operation of a non-reversible rack and pinion or screw mechanism driven by a hand crank, as required by the purchaser. The struts shall be fitted in pairs to support each side of the frame; except that in the case of the thigh and leg sections only one strut per section is required. The mechanism used shall be robust and shall provide positive location, so that unintentional change of position is eliminated.

4.7.3 Filling

Filling for the sub frames shall be of mild steel slats or perforated mild steel plate, as specified by the purchaser. The cross-sectional dimensions of mild steel slats shall be at least 38 mm x 2 mm and the ends of the slats shall be fusion-welded, over their full width, to the inside of the sub frame in acceptable positions, 32 mm apart. The perforated mild steel plate shall be of nominal thickness at least 2 mm and shall be removable for cleaning or autoclaving.

4.8 Finish

All surfaces shall be smooth, clean, and free from pits, deep scratches, scale, crimps, buckles, and other defects. All sharp corners and edges that can cause damage to overlay or injury to attending staff shall be ground smooth. Stainless steel surfaces shall have a medium directional satin finish or a bright polished finish, as specified by the purchaser. The quality of the finish shall be not inferior to that of the relevant reference sample held by the South African Bureau of Standards. Mild steel surfaces shall have a smooth enamel finish or a smooth powder-coating finish, as specified by the purchaser, and of quality complying with the relevant requirements of CD-ARS 2061.

4.9 Buffer wheels

When so specified by the purchaser, buffer wheels shall be fitted to the legs of the bed and located just above the castor fittings. The rims of the buffer wheels shall be of solid, smooth non-marking hard rubber or plastics material.

Note: All dimensions are in millimetres

5 Marking

5.1 The manufacturer's name or trade name or registered trademark shall appear in legible and indelible marking on every orthopaedic bed.

5.2 Methods of marking

The marking shall be applied by means of embossing or stamping on the frame or by means of an indelible transfer. The marking shall be of area at least 5 cm².

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Bibliography

CKS Orthopaedic beds-CKS 390:2009

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