

The DeltaDeck® access platform, winner of the “Professional Builder Magazine 2007 Award” has been designed, assessed and tested against a number of National and International Standards.

The product: The DeltaDeck® is supplied as a complete folding unit with no loose components. It provides a 1,100mm X 600mm working area, a 3m Maximum Working Reach Height and a 200Kg SWL (Safe Working Load).

The platform height can be adjusted between 450mm and 865mm. The smallest and largest footprints of the product are 1,375 X 750mm and 2,185 X 750 mm respectively and it weighs 26.5 Kg.

The DeltaDeck® is manufactured under a BS ISO 9001 approved Quality System.

In the absence of a specific British, European or other international standard for this product, tests have been performed and assessments made against the following standards.

Rung requirements of BS EN 131-2 “Ladders Specification for requirements, testing, marking”

The DeltaDeck® complies with the requirements of the following clauses of BS EN 131-2:

Clause 4.7 relative to the non-slip textured surface of rungs and relative to the firm and durable connections between the rungs and the stiles (rungs are fully welded at both ends),

Clause 5.6.2 relative to the maximum permanent deformation of rungs following the application of a vertical test load of 2,600N (the rungs have a total clear span of 647.4mm, have an outside diameter of 38.8mm and have a second moment of area of 31,360.3 mm⁴),

Clause 5.7 relative to the maximum angular deformation of rung connections following torsional tests (the rungs are fixed-fixed and fully welded at both ends).

The DeltaDeck® has nine height and ladder angle settings. The steepest angle for the ladder section is about 85 degrees. The reason “Ladder Standards” tend to limit the maximum angle of use to 75 degrees is to avoid a situation where the user falls backwards pulling the ladder away from the wall or other supporting surface. This is not a possible mode of failure of the DeltaDeck® during use and therefore this requirement is not relevant to this product.

Rung spacing requirements of BS EN 1004: The spacing between rungs perpendicular to the direction of the stiles of the ladder section is 220.3mm. Because the DeltaDeck® has nine angle settings, the rung spacing needs to accommodate all the different angles and different platform heights, whilst still being comfortable for the user. A single rung between the ground and the working platform would have been a little uncomfortable for certain height settings and the spacing of 220.3mm seems best for this product application. BS EN 1004 allows a distance from the ground to the first step or rung of 400 mm. However, if the first step is a platform, then 600 mm is allowable.

BS EN 1004 load requirements and test results: Tests were carried out and results assessed using stringent general ultimate limit state design guidance from BS EN 1004.

Load tests were carried out in the most onerous configuration of maximum leg extension and lowest angle setting.



Figure 1: The DeltaDeck® access platform

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Based on the guidance and formulae from BS EN 1004 the maximum uniformly distributed service load for the product is calculated to be 239.6Kg. Our literature claims and uses 200Kg as the Maximum SWL (Safe Working Load) per deck evenly distributed.

Requirements of Canadian standard Z797-09 “Code of practice for access scaffold” and load tests results:

The DeltaDeck® guardrails were tested against the Canadian standard Z797-09 requirement for the guardrails to resist a point load of 900N without failure.

The DeltaDeck® passed both load tests for *Loads perpendicular to the End Gate* and *Loads perpendicular to the Side Guardrails*. More detailed reports covering the above tests can be made available if required.

If you would like to know more details, or about more specific tests relevant to a particular application or requirement, please do contact us as we may have already tested or assessment the product against your requirements.

Awards

In 2007, the DeltaDeck® won the Health & Safety Category of the “Professional Builder Magazine” Awards. The Professional Builder Magazine is the business magazine for builders, plumbers and timber merchants providing practical and informative articles on subjects that matter to professional builders merchants.

Easy to transport

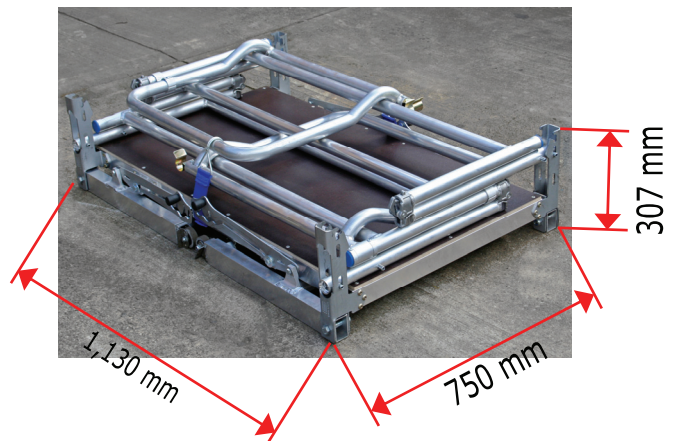


in a VW Passat



or in a VW Polo

Folded transport dimensions of the DeltaDeck®



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Appendix A: Comparisons with Australian and New Zealand standards

RUNG NON-SLIP REQUIREMENTS:

Requirements of **BS EN 131-2** “Ladders Specification for requirements, testing, marking”

The DeltaDeck® complies with the requirements of the following clause of BS EN 131-2:

Clause 4.7 Rungs/steps/platforms

“Rungs, steps and platforms made of metal or plastics shall have a textured surface on the working face to reduce slipping.

The contact surface of the coverings shall adhere firmly to the rungs or steps.

Rungs and steps shall be firmly and durably connected to the stiles.”

The DeltaDeck® rungs are made from non-slip serrated aluminium material and are fully welded to the stiles at both ends.

Requirements of **AS/NZS18921-1996** “Portable Ladders Part1 – Metal”

The DeltaDeck® complies with the requirements of the following Clause:

Clause 2.6.1 (a) “Treads and rungs shall present a working surface that will minimize the possibility of slipping.

Working surfaces of rungs, steps, and platforms for use in ascending, descending, working or standing, shall be corrugated, serrated, knurled, dimpled, or coated with a skid resistant material.”

The DeltaDeck® rungs are made from non-slip serrated aluminium material and are fully welded to the stiles at both ends.

MAXIMUM PERMANENT DEFORMATION OF RUNGS:

BS EN 131-2 requirements

Clause 5.6.2 Rungs and steps

“In the position of use of the ladder a test load F of 2 600 N shall be applied vertically on the mid-point of the weakest rung or step of any design evenly distributed over a width of 100 mm and a depth equal to the rung/step and for the duration of one min. The maximum permanent deformation after removal of the test-load shall be less than or equal to 0,5 % of the inner width b1 (see EN 131-1), measured underneath the tested step.”

The DeltaDeck® rungs have a total clear span of 647.4mm, have an outside diameter of 38.8mm and have a second moment of area of 31,360.3 mm⁴. A load of 2,600N leads to a maximum stress of 133N/mm² which is well below the minimum 0.2% proof stress of 250 N/mm² of the material used. Therefore the rung does not deform plastically under the test load and does not suffer any permanent deformation.

AS/NZS18921-1996 requirements

Clause 9.2.5 **Rung strength test** “When tested in accordance with Appendix H, the permanent set in the rung shall not exceed 1 per cent of the rung length between the faces of the stiles and the ladder shall not suffer structural failure.”

A load of 2,940N leads to a maximum stress of 151N/mm² which is well below the minimum 0.2% proof stress of 250 N/mm² of the material used. Therefore the rung does not deform plastically under the test load and does not suffer any permanent deformation.

ANGLE OF LADDER SECTION IN USE:

The DeltaDeck® has nine height and ladder angle settings. The steepest angle for the ladder section is about 85 degrees. The reason “Ladder Standards” tend to limit the maximum angle of use to 75 degrees is to avoid a situation where the user falls backwards pulling the ladder away from the wall or other supporting surface. This is not a possible mode of failure of the DeltaDeck® during use and therefore this requirement is not relevant to this product.

RUNG SPACING REQUIREMENTS

Rung spacing requirements of **BS EN 1004:**

Clause 7.6.2 General requirements

Access to the platforms in an assembled tower shall be within the main structural supports and shall:

- have a distance from the ground to the first step or rung of 400 mm maximum (if the first step is a platform, 600 mm is allowable);

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- have steps/rungs with constant spacing and a slip resistant surface.

The spacing between the rungs perpendicular to the direction of the stiles of the ladder section is 220.3mm. The DeltaDeck® has nine angle settings and the rung spacing is designed to accommodate all the different angles and different platform heights, whilst still being comfortable for the user. A single rung between the ground and the working platform would have been a little uncomfortable for certain height settings and the spacing of 220.3mm seems best for this product application.

Rung spacing requirements of **AS/NZS 1576 “Scaffolding”**: AS/NZS 1576 does not seem to specify rung spacing requirements in the same way as stated in BS EN 1004.

LOAD REQUIREMENTS AND TESTS

BS EN 1004 load requirements and tests: Tests were carried out and results assessed using stringent general ultimate limit state design guidance from BS EN 1004.

Load tests were carried out in the most onerous configuration of maximum leg extension and lowest angle setting. Based on the guidance and formulae from BS EN 1004 the maximum uniformly distributed service load for the product is calculated as 239.6Kg. Our literature claims and uses 200Kg as the Maximum SWL (Safe Working Load) per deck evenly distributed.

AS/NZS 1576.3 load requirements: *Appendix A: “TEST ON ASSEMBLED TOWER”*:

The AS/NZS 1576 load requirements when applied to the DeltaDeck® translate into a test load A1 = 164.1 Kg and a test load A2 = 74.1 Kg. These two loads, i.e., a total of 238.2Kg, are required to be applied to the DeltaDeck® simultaneously.

The DeltaDeck® complies with this requirement as it held an ultimate test UDL (Uniformly Distributed Load) of 445Kg.

GUARDRAIL POINT LOAD REQUIREMENTS AND TESTS

Guardrail point load requirements of **Canadian standard Z797-09** “Code of practice for access scaffold”

DeltaDeck® guardrails were tested against the Canadian standard Z797-09 requirement for the guardrails to resist a point load of 900N without failure.

The DeltaDeck® guardrails were tested against the Canadian standard Z797-09 requirement for the guardrails to resist a point load of 900N without failure.

The DeltaDeck® passed both load tests for *Loads perpendicular to the End Gate* and *Loads perpendicular to the Side Guardrails*.

Guardrail point load requirements of **Australian draft standard AS 1657** “Fixed platforms walkways stairways and ladders Design construction and installation”

Section 6, Physical edge protection

6.1 DESIGN LOADS

6.1.1 Edge Protection

Guardrails, handrails and intermediate rails (including members and connections that provide structural support) shall be designed to sustain the following imposed actions:

A force of 600 N acting outwards or downwards at any point on the top rail, intermediate rail or post.

A force of 350 N per linear metre acting outwards or downwards on the top rail or intermediate rail.

Wind loading in accordance with AS/NZS 1170.2.

The uniformly distributed load, point load and wind loads are not additive and shall be considered as three separate loading situations. All loads shall be positioned on the member for the worst effect. No part of the system shall deflect elastically by more than 40 mm under these loads.

With respect to the DeltaDeck® the 600N (61.2Kg) point load is the most onerous of the loads and is well below the 900N point load requirement of **Canadian standard Z797-09** with which the DeltaDeck® complies.