



## Ergonomics approved quality label

Matador Stapmaat



**vhp** human performance b.v.  
Huijgensstraat 13a  
2515 BD The Hague / The Netherlands  
T +31 (0)70 - 38 92 010  
F +31 (0)70 - 38 92 413  
info@vhphp.nl  
www.vhphp.nl

IBAN NL27ABNA0486072894  
BIC ABNANL2A  
KVK Haaglanden nr. 27259365  
BTW NL8121.45.471.B01

---

Date  
08-06-2021

Authors  
drs. Kees Peereboom  
ir. Bas van Leeuwen

Client  
Matador bv

vhp project number  
000901



# 1 Introduction

This report contains the assessment for a vhp occupational health and safety and ergonomics quality mark for the Matador Stapmaat. During the assessment of the vhp occupational health and safety and ergonomics quality mark, the functional and usage aspects of the product are assessed in terms of compliance with the guidelines for physical load from the Dutch Handbook of Physical Workload<sup>1</sup>. General regulations regarding physical load also apply, including pushing and pulling<sup>2</sup>. In addition, the following standards applicable to this product were assessed:

- NEN EN 14183<sup>3</sup>:2004 and NEN 2484 (European variant) as far as applicable to this product.
- NEN-EN 349:1994 Safety of machinery - minimum distances to prevent harming parts of the human body
- NEN-EN 894-1:5 Safety of machinery - ergonomic requirements for the design of displays and control actuators
- NEN-EN 1005-1:5 Safety of machinery - human physical performance.
- NPR 3637 Surface roughness. Guideline for the relationship between the function of a working surface and the roughness value.

## 2 Product: Matador Stapmaat

The Matador Stapmaat is a mobile stepping platform with a total height of 40 cm. The platform automatically brakes as soon as a person (with a minimum weight of 50 kg) steps on to it by using the suspension on the wheels. The Stapmaat has a railing where one can stand with the upper legs against a support (support height is 16 cm) during the stacking and unstacking of for example a pallet or a wheeled cage. At the same time the user can lean against a rail at hip height. Also a box or crate can be supported on this. The Stapmaat has an anti-slip floor surface. The Stapmaat can be used from both sides, so that it does not have to be moved often. Because of the small dimensions, the Stapmaat can also be moved through narrow passages (e.g. during order picking or transport in a warehouse).

## 3 Features Matador Stapmaat

The Matador Stapmaat includes the following features and specifications:

<sup>1</sup> Dutch Handbook of Physical Workload, editors K.J. Peereboom Eur.Erg. and N.C.H. de Langen, seventh revised edition, 2016. The standards of Mital et al (1997) are used for pushing and pulling.

<sup>2</sup> According to the Dutch Working Conditions Act, employers must ensure that physical load does not endanger the safety and health of their employees (Working Conditions Decree 5.2). Employers are obliged to include the risks of pushing and pulling in their risk inventory and evaluation and the Plan of Action. Employers must also provide proper information on how employees can push and pull objects in a safe and healthy manner, see: [www.arboportaal.nl](http://www.arboportaal.nl) (in Dutch).

<sup>3</sup> This European Standard specifies the requirements for step stools, stairtype steps and dometype steps stools. This includes design characteristics, dimensions, materials, performance requirements, test methods and the declaration of suitability of use. The standard excludes ladders and stepladders as defined by EN 131-1:1993.

- The Stapmaat is a solution for high lifting. According to the NIOSH standard (see Dutch Handbook of Physical Workload, 2016, footnote 1): lifting manually above 180 cm should be avoided. The height of the platform is 40 cm and when picking up a box or crate (e.g. 20 cm high) at the bottom, a maximum height of 240 cm is acceptable.
- Reduction of shoulder and back strain by preventing high lifting.
- Two steps of 200 mm each
- Ball bearing swivel castors
- Automatic braking when standing on the platform (user must be over 50 KG)
- Dimensions floor surface: 790 x 790 x 210 mm (w x d x h)
- Dimensions: 1st step: 750x750x200mm (wxdxh), 2nd step: 495x495x200mm (wxdxh)
- Railing 550x550x1170mm (wxdxh), diameter 25 mm
- Total height: 1170 mm
- Load capacity: 220 kg
- Own weight 48 KG
- Material: aluminium.

## 4 Ergonomics approved quality label



The Matador Stapmaat is approved of and provided with the vhp mark of quality for working conditions and ergonomics.

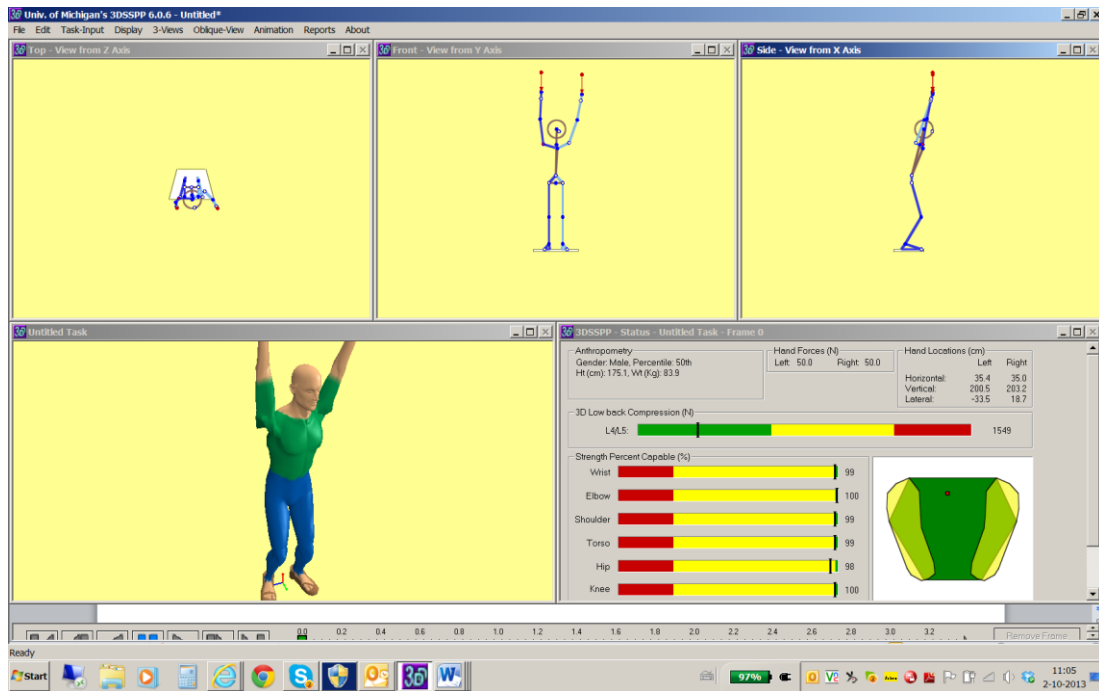
The Matador Stapmaat makes it possible to maintain a lifting height of 180 cm maximum when lifting up to 240 cm. The back strain is thereby 29% lower in comparison with high lifting without a Stapmaat. In addition, the upper legs or hips can be safely supported against the railing. Pushing and pulling the Stapmaat meets the EU standards.

## 5 Appendix

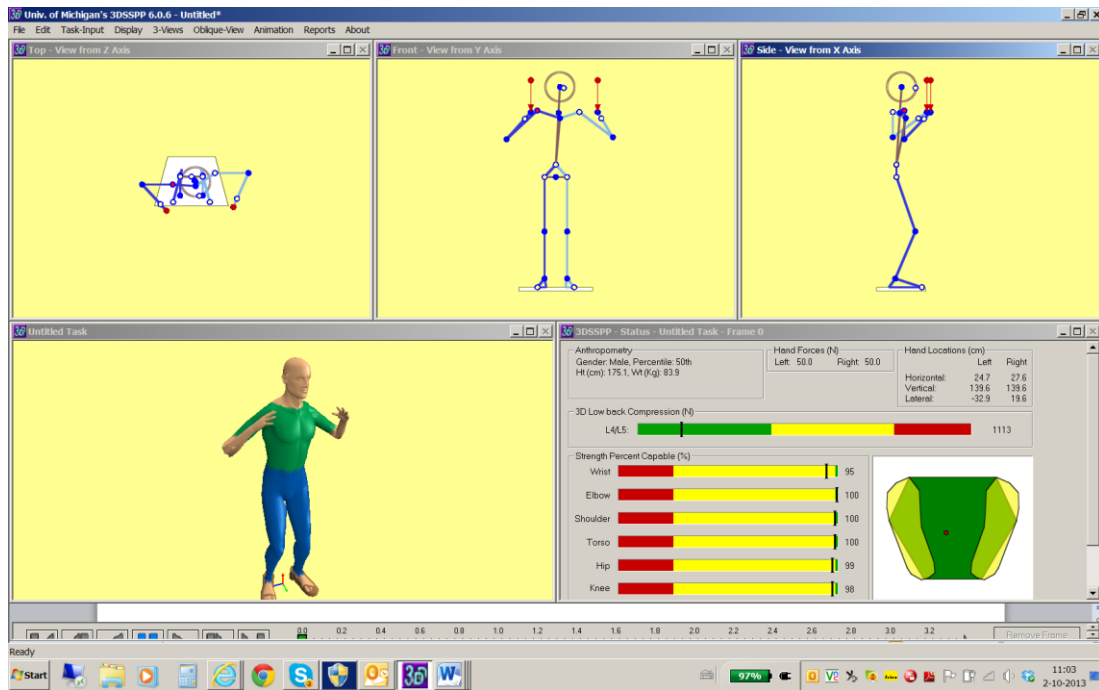
De Stapmaat meets the following requirements:

1. The Stapmaat is a solution for high lifting. According to the NIOSH standard (see Dutch Handbook of Physical Work Load, 2016, footnote 1), lifting over 180 cm should be avoided. Because the Stapmaat is 40 cm high and when picking up a box or crate (e.g. 20 cm high) at the bottom, lifting up to 240 cm height is possible.
2. The Stapmaat is suitable for passages from min. 0.75m width onwards.
3. The Stapmaat includes two steps maximum in order to reach the platform height.
4. The maximum height of a step is 0.21m, the depth of a step is min. 0.13m
5. The Stapmaat is suitable to carry a weight of 220kg
6. The Stapmaat has 2 swivel wheels and 2 fixed wheels
7. The diameter dimensions of the wheels are minimal 0,10 diameter.
8. The wheels have to be automatically fixed/braked when a weight of > 20 kg is placed on the Stapmaat.
9. The Stapmaat has no protruding or sharp corners, all edges are flattened.
10. There is a solid railing placed of cm for support at hip level and for safety at the back on 2 sides of the Stapmaat.
11. The wheels of the Stapmaat are shielded in such a way that hardly any ropes, plastic etc can come between them.
12. The floor surface of the steps does not contain any protruding or upright parts and must have a friction coefficient of at least 0,4 (Dutch NPR friction coefficient).
13. The Stapmaat is made of fire retardant material.
14. The Stapmaat does not charge statically/electrically and does not conduct electricity.
15. The Stapmaat can be moved with a maximum force of 26 N for pushing and 18 N for holding. With pulling this is 19 N at the starting force and 15 N at full force. Movement over 2m is assumed at a frequency of 12x per hour.
16. The Stapmaat size is suitable for taking a right angle turn.
17. The wheels are suitable for hard, smooth surfaces.
18. The floor surface of the Stapmaat is horizontal during use.
19. During normal intended use of the Stapmaat it is not possible to injure parts of the body by crushing, cutting or cutting.
20. When lifting a carton/box of 10 KG with arms outstretched the Stapmaat remains stable.
21. The Stapmaat platform can be moved with the help of a fork-lift truck or a spoon truck.

An analysis was made with the biomechanical calculation model of Chaffin 3DSSPP for lifting up to a height of 240 cm with and without the Stapmaat. Lifting up to a height of 240 cm of 10 KG without Stapmaat (frequency is 1x):



Back load L4/L5: 1549 N.



Back load L4/L5: 1113 N

The difference is: a 29% lower back load when the Stapmaat is used for high lifting compared to not using a Stapmaat.

vhp human performance – Ergonomics approved quality label Matador Stapmaat