Certificate of shape stability

1. Ref. transp. packaging unit:	Deltarack 4BL - edge flange	
2. Ref. measuring report:	Deltarack	- 20120810002
3. Company:	Deltarack	
4. Performed test:	Acceleration test according to: Be RD of April 27th 2007, VCAT-40509:2010,	
5. Date:	10-08-2012	EN12195-1:2010

6. Description of the tested transport packaging unit

Description:

The load unit consists of a wooden rack type 4BL, containing two concrete blocks of 750kg. Two edge flanges are placed against the concrete blocks. The flanges and the blocks are joined with the rack by two diagonal straps. Two vertical straps are used to prevent tilting of the blocks.

Primary packaging: Concrete plate — Secundary packaging: Deltarack B4L

Tertiary packaging: Stretch film: ☐ Stretch hood: ☐ Shrink hood: ☐ Straps: ☑

Add transport packaging: 2 vertical straps, 2 diagonal Straps

Anti slip up the pallet: ☐

Anti slip up on layer(s):

Stacking pattern: /

Pallet type: / — # Layers: 0

Height [mm]: 1200 — Weight[kg]: 1600

Length - LP [mm]: 2000

Width - BP [mm]: 770

7. Name and signature responsible of the packaging:

8. Test conditions: Relative humidity: 20% - Temperature: 65°C - Sliding of the pallet is prevented mechanically.

9. Picture in the BP-direction after the test.

Picture in the LP-direction after the test.

10. Conclusions:

No conclusions

The tested load unit is shape stable in the LP-direction at 0.8g under the specified test conditions.

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11. Name and signature responsable of the test: Ing. J. Dendauw

ESTL nv is a spin-off from:

TEST REPORT of the ACCELERATION TEST based on RD of April 27th 2007, EN12195:2010, VCAT-40509:2010

Ref. transp. packaging unit:	Deltarack 4BL - edge flange		
Ref. measuring report:	Deltarack	-	20120810002

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Specifications of the test

Client

Company:	Deltarack
Address:	Lodewijk De Koningcklaan 310
	2320 Hoogstraten
	België
Contact pers.:	Jan Servaes
Tel. nr.:	0032 477 59 56 70
Fax nr.:	0
Mob. nr.:	0
E-mail:	info@deltarack.com

Test details:

Test facility:	ESTL nv, wafelstraat 45, 8540 Deerlijk, België
Test responsible:	Ing. Jelle Dendauw
Test equipment:	VCAT/ Acceleration bench /090530
Test date:	10-08-2012
People attending:	Jelle Dendauw (ESTL), Jan Servaes (Deltarack)

Temperature [°C]:	65
Rel. humidity [%]:	20
Load conditions:	Sliding of the load unit is prevented mechanically.

Attached documents to the report: /

Goal of the acceleration test

According to the Belgian RD* of April 27th 2007 and the EN12195:2010, a load securing layout has to be capable of withstanding certain forces of inertia. These forces amount to 0,8g in forward direction, 0,5g in rearward direction and 0,5g in the sideward directions. The acceleration test allows for an unambiguous assessment of a certain load unit, secured in a specified manner, with the rules and regulations of the Belgian RD.

A load unit is placed on a platform and is secured in the correct orientation and according to a specified securing layout. The platform is then accelerated at 0,8g to imitate the influence of the forces of inertia originating from the forward deceleration as prescribed in abovementioned RD. The stability of the load unit is then assessed. If the load unit is deemed stable, it is rotated 90 degrees, together with the securing layout. Next, the platform is accelerated at 0,5g to imitate the influence of the forces of inertia originating from the sideward acceleration prescribed in abovementioned RD. After this test the stability of the load unit is assessed once again.

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Report specifications

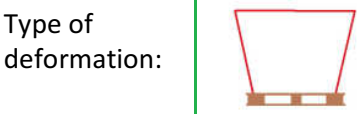
Report:	20120810-002	Date:	10-08-2012	Author:	Dendauw Jelle
Company:	Deltarack			Contact:	Jan Servaes
Pallet name:	Deltarack 4BL - edge flange				

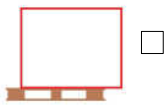
Conclusions

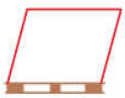
Acceleration:	0.6	Direction:	LP

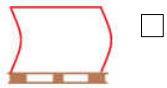
The pallet behaves stable? ☑

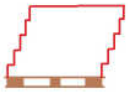
Type of deformation: ☐









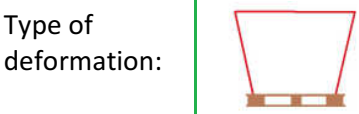


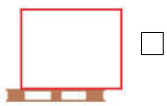
The load unit is behaving shape stable at 0.6g in the LP-direction
(The lashing is only a security feature and isn't supporting the rack.)

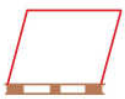
Acceleration:	0.8	Direction:	LP

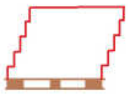
The pallet behaves stable? ☑

Type of deformation: ☐









The load unit is behaving shape stable at 0.8g in the LP-direction
(The lashing is only a security feature and isn't supporting the rack.)

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General remarks and conclusions

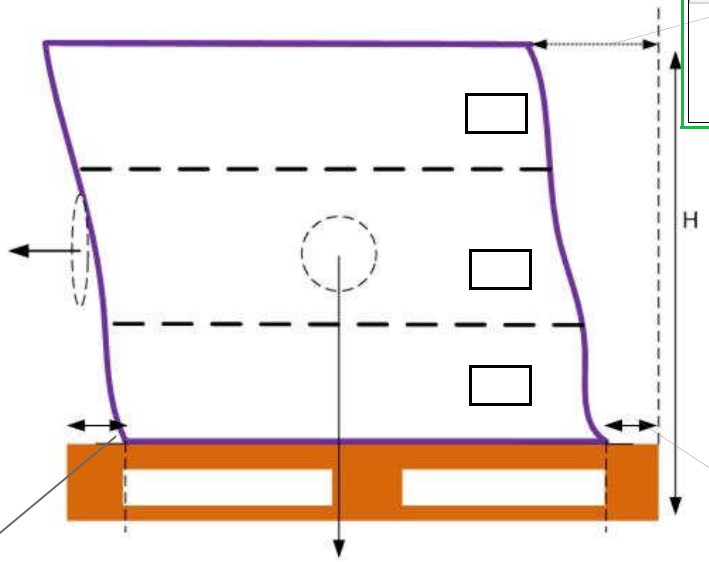
Conclusion:
- The pallet is behaving shape stable up to 0,8g in the LP-direction.

Results

acc	dir	B	A	R
0.6	LP	0	0	0.2
0.8	LP	0	0.6	0.6

Containment force short side [kg]:

Top:	
Mid:	
Bottom:	



acc	dir	B	A	R
0.6	LP	0	0.2	0.2
0.8	LP	0	-0.6	0.6

Containment force long side [kg]:

Top:	
Mid:	
Bottom:	

acc	dir	B	A	R
0.6	LP	0	0	0.2
0.8	LP	0	0.6	0.6

Stretch foil specifications

Stretch film: / Thickness [µm]: 0 Producer: /

Pre-stretch[%]: 2nd Stretch[%]: Stretch wrapper:

Weight (g): Practical stretch [%]: Pallet roping: ☐ # Wrappings:

Overlap when going up [%]: Overlap when going down [%]:

Position of the roping [mm]: Foil overlap at the top [mm]:

The measurement protocol is available upon request.

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Pallet specifications

Name of the pallet: Deltarack 4BL - edge flange

The load unit consists of a wooden rack type 4BL, containing two concrete blocks of 750kg. Two edge flanges are placed against the concrete blocks. The flanges and the blocks are joined with the rack by two diagonal straps. Two vertical straps are used to prevent tilting of the blocks.

Pallet type: /

Stacking pattern: /

Layers: 0 Cases per layer: 0

Tie sheet between load and pallet ☐

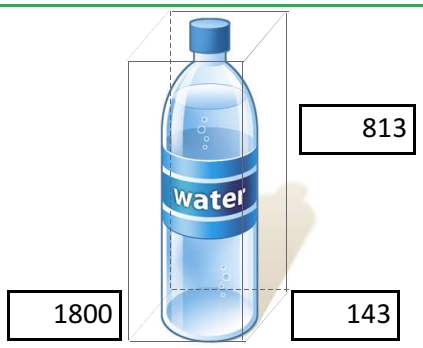
Tie sheet on top of layer(s):

LP [mm]: 2000 BP[mm]: 770 Weight [kg]: 1600 Height [mm]: 1200

Primary packaging

Name.: Concrete plate

Type: /



Secondary packaging

Name: Deltarack B4L

Theor. head space [mm]:

Gross weight [kg]: 1527

Compression force [N]:

Fluting type: /

Prim units per sec. unit: 1

Additional packaging

2 vertical straps, 2 diagonal Straps

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Guideline accompanying the measurement report or certificate

General remark

Some fields can be left blank, if they are irrelevant or if the described value was not measurable.

List of used abbreviations

Abbreviation	Explanation
BP	When a pallet is loaded in the BP-direction on the platform of the acceleration bench, the "long direction" of the pallet is perpendicular to the acceleration direction. When a EUR pallet is placed on the acceleration bench, we get the following view, when looking sideways to the bench: 
LP	When a pallet is loaded in the LP-direction on the platform of the acceleration bench, the "long direction" of the pallet is parallel with the acceleration direction. When a EUR pallet is placed on the acceleration bench, we get the following view, when looking sideways to the bench: 
acc	The acceleration where the pallet was exposed to. (typically 0,5g or 0,8g). This value is expressed in 10^{-1}m/s².
dir	The direction of the load on the acceleration bench. This value is LP or BP.
B (Before)	The distance between the load and the reference point (the pallet edge or a vertical line coincident with the pallet edge), measured before the test. The measurements are expressed in cm.
A (After)	The distance between the load and the reference point (the pallet edge or a vertical line coincident with the pallet edge), measured after the test. The measurements are expressed in cm.
R (Result)	The difference between the B (before) and A (after) measurement, expressed in cm.
LP [mm]	The dimension of the load in the LP-direction
BP [mm]	The dimension of the load in the BP-direction

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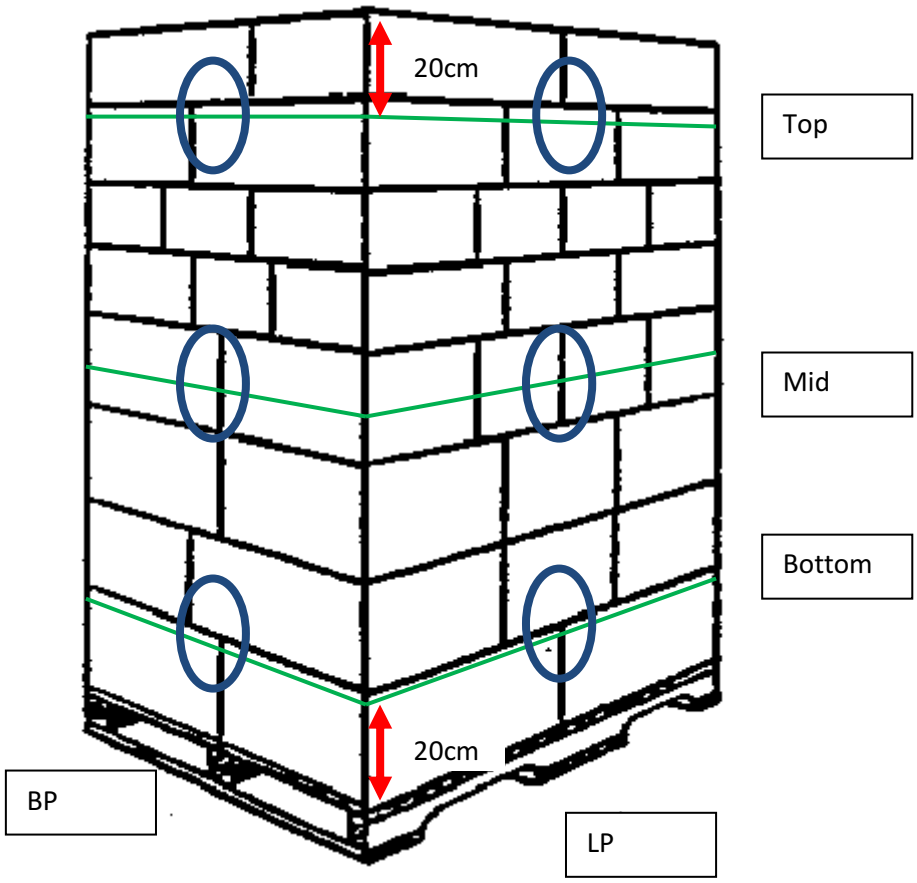
Measuring protocol of containment force.

This measuring method is only applied on pallets with stretch film.

A metal disk with a diameter of 15 cm is inserted between the load and the stretch film at the following positions:



Pull the disk 10cm away from the pallet surface. Use a hand balance with a measuring range of 50kg, to measure the force necessary to obtain a displacement of 10cm. Keep your hand steady for at least 4 seconds and read the measurement.

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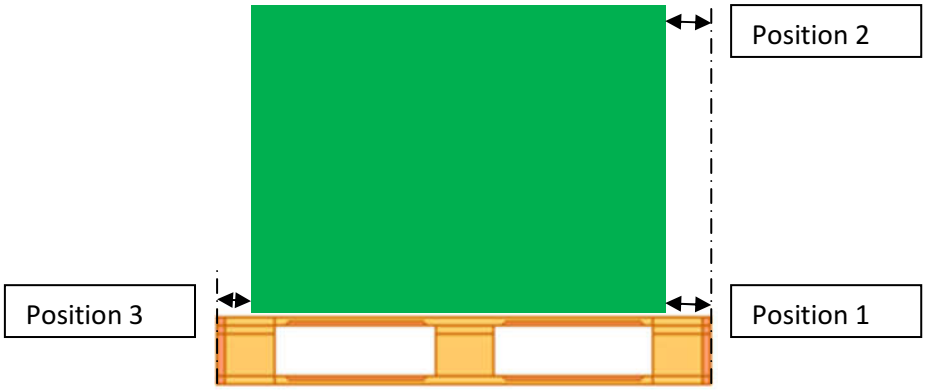
Measuring the deformation of the pallet.

To measure the deformation of the pallet, measurements are taken at three different points before and after the test. The difference between those measurements is used to judge if the pallet behaves stable are not. If the load is inferior to the pallet edges, the value is marked as – x. A positive value is used for an outboard conditions. The measurements are taken at the following points:



Judgment of the stability.

A pallet is considered as stable by ESTL if:

- The pallet and its load form a unity. During the movement the pallet has to follow the motion of the load.
- If the plastic deformation (the R values) of the pallet after the test is limited to approx. 4% of the height.
- The integrity of the transport packaging is maintained.

A pallet can be considered as stable if the check mark next to “The pallet behaves stable”, on the first page of the report is checked or if a certificate has been made. To have a stable pallet, the pallet needs to be stable in both directions.