

DEKRA-VDI-Symposium 2013

VDI Guideline 2700 Part 18 Securing of cargo in soft packs

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EUMOS - Meaning



EUMOS

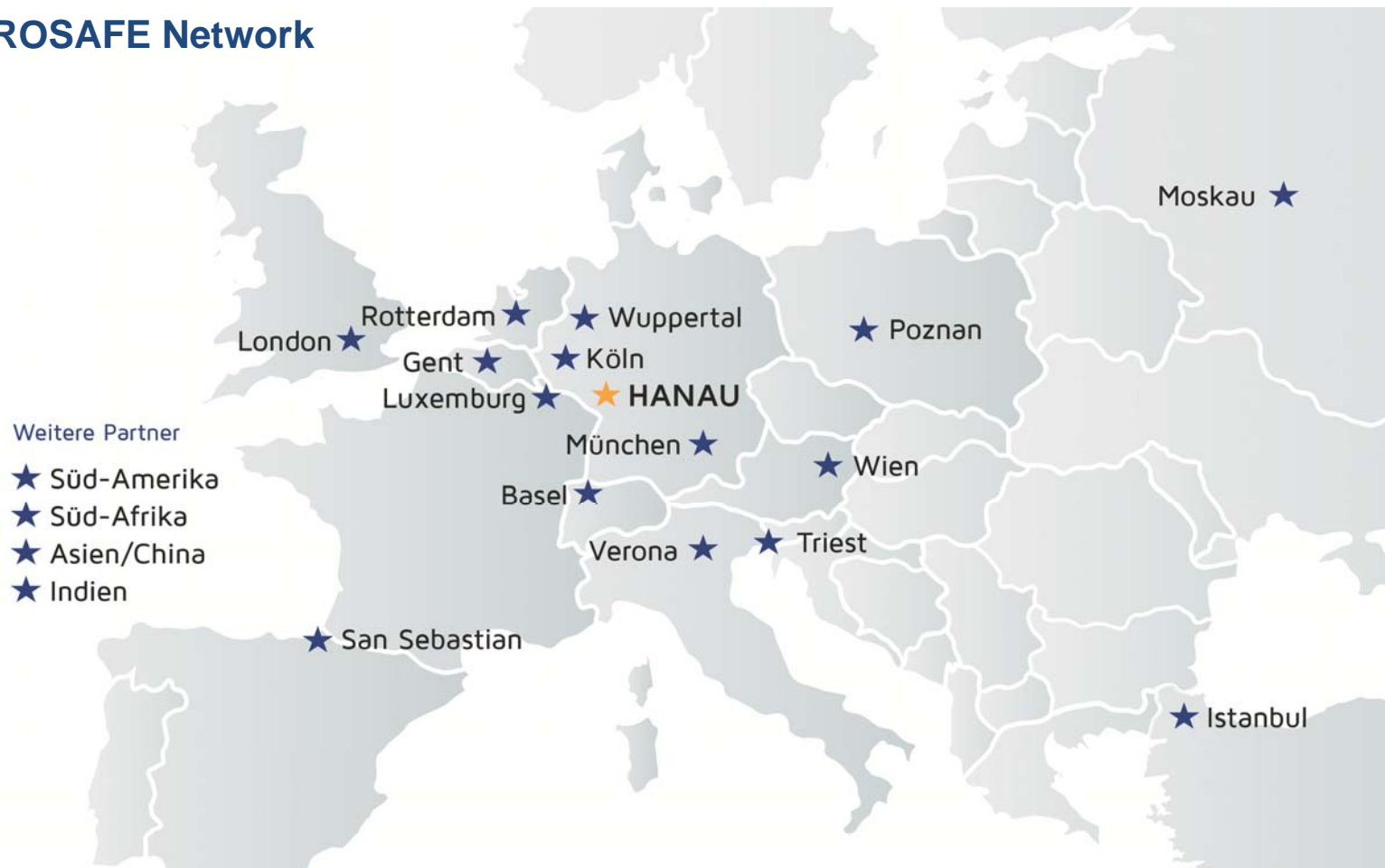
= EUROPE MOVE IT SAFE / EUMOS

= Europäischer Sachverständigenverband für
Ladungssicherung und Transportsicherheit /
EURO-LAS-T e.V. (official name at present)

For more information see: www.eumos.eu

EUROSAFE: Process optimisation of cargo securing by the industry (www.euro-safe.com)

EUROSAFE Network



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- Cargo securing of Big Bags



What can happen?



Origin: MAWI

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Development of guideline 2700 part 18 (practically oriented)

1. 1st meeting **October 2007 / cooperation with delegates from France and NL**
2. Execution of more than **30 meeting days**
3. **Consideration of int. guideline assignment (Best Code of Practice / CEFIC)**
4. Participants are at present:
 - Employers liability Insurance coverage (Berufsgenossenschaft)
 - Federation of Goods Traffic Logistics and Removal (BGL),
 - Delegates of chemical industry
 - Delegates of truckage companies
 - Delegates of TÜV Rheinland and DEKRA (until 2011)
 - **No delegates from manufacturers of cargo securing equipment**
4. **Draft for green print filed in November 2013**

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VDI 2700 Part 18: Expectations



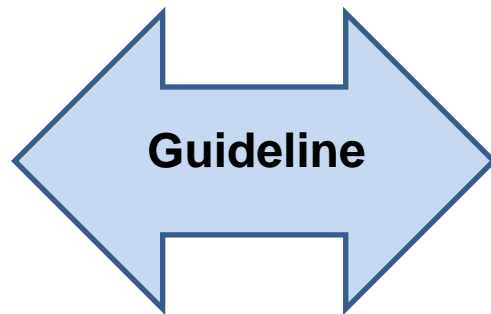
A field study with a systematic investigation of the behaviour of bulk cargo in big bags was planned to run in 2008.
This project could not start because of high costs (approx. 300-350 T€) and lacking willingness to take these costs.

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VDI 2700 Part 18: Results



Differentiation to rigid cargo

Bulk cargo in big bags is not rigid and cannot be fixed definitely to the vehicle as well.

The guideline illustrates possibilities how bulk cargo can be secured. However, in many cases “single decisions” are necessary.

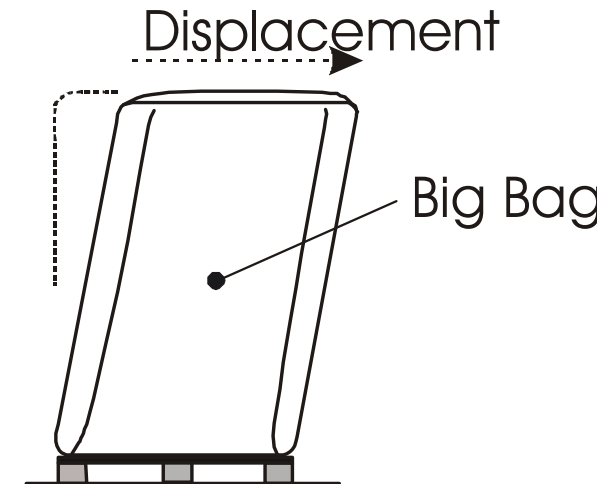
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- Cargo securing of Big Bags



Differentiation to rigid and elastic cargo

Despite rigid or elastic cargo under the influence of inertia or acceleration forces with reference to the loading platform reacts with sliding (or thrust), tilting or rolling movement, for inelastic cargo another kind of movement is possible which should be named as displacement.



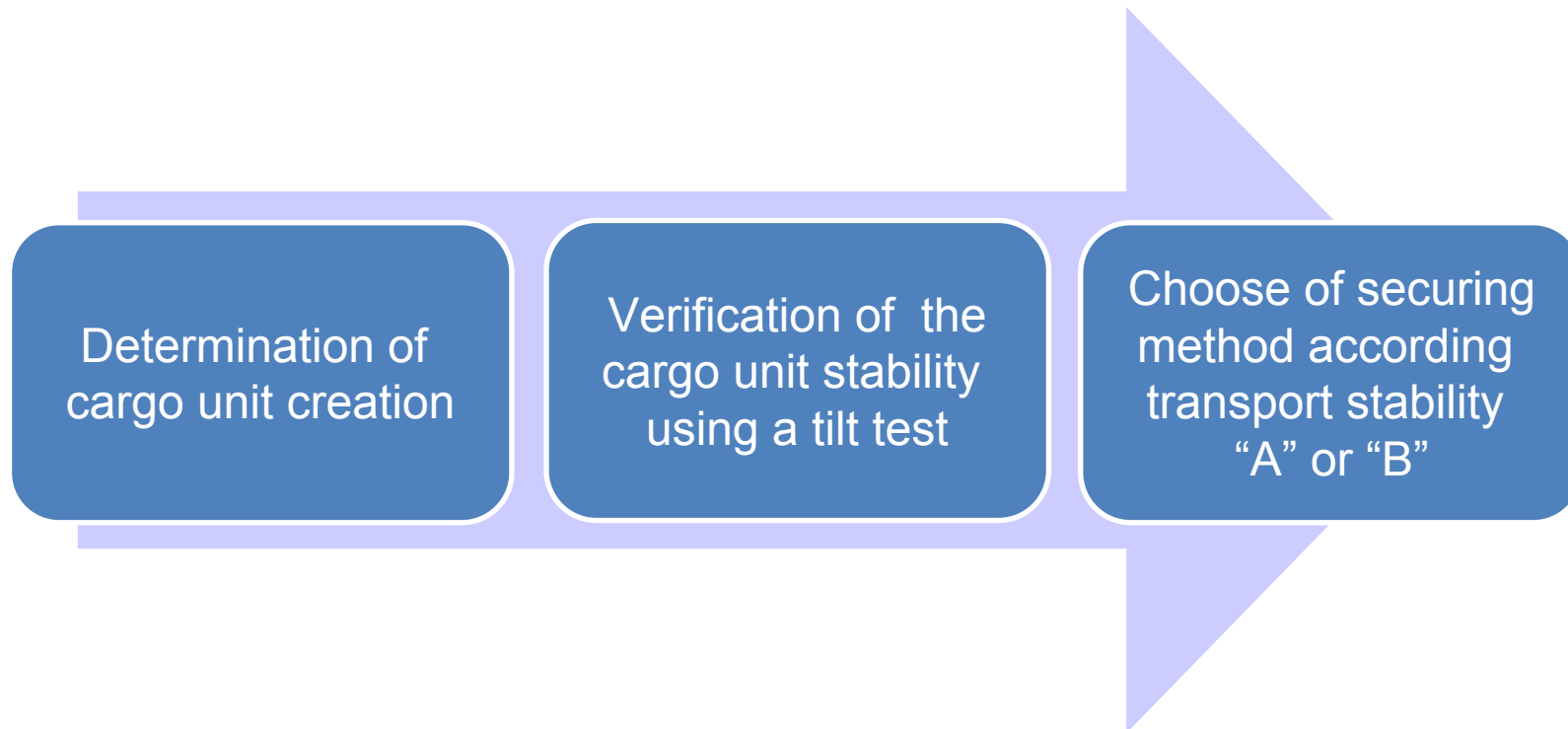
For example the cargo mass is moving forward in driving direction, but the contact are does not move (see picture) and the cargo does not go back into the initial state. This kind of movement does not exist for packaged rigid cargo.

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- Cargo securing of Big Bags



Procedure to determine a securing method for products having an angle of response between **15 and 45 degree**.



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Product attributes



Group 1; $\alpha > 45$ degree



Group 2; $\alpha = 15-45$ degree



Group 3; $\alpha = 0-15$ degree

If a bulk cargo is spilled out it forms a cone with the gradient angle α . Depending on the cargo, its surface and moisture content the gradient angle differs with wide difference. The classification of the gradient angle results into 3 groups:

- Group 1: Gradient angle $\alpha > 45$ degree
- Group 2: Gradient angle $\alpha > 15-45$ degree
- Group 3: Gradient angle $\alpha = 0-15$ degree

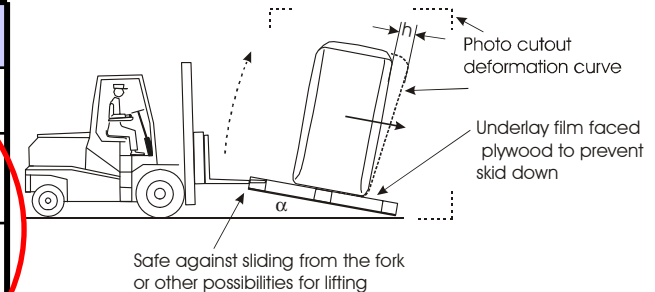
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- Cargo securing of Big Bags



Decision support for the estimation of measures for cargo securing

Vehicle class	Transport stability	
	Stable cargo unit (A)	Unstable cargo unit (B)
Curtainsider vehicle EN 12642 XL	7.1, 7.2, 7.3, 7.4, 7.5,	7.1, 7.3, 7.5
Curtainsider vehicle EN 12642 L	7.2, 7.3, 7.4	7.3
Vehicle with tailboard, headboard and side panels EN 12642 L	7.2, 7.3, 7.4, 7.5	7.3
Vehicle with box body EN 12642 XL ¹⁾	7.1, 7.2, 7.3, 7.4, 7.5	7.1, 7.3, 7.5
Remark: The classification of the transport stability has to be defined based of tests by the user		
¹⁾ with form-lock at the side walls not belt for tie-down lashing necessary		
Explanation / assessment stable / unstable cargo unit		
Stable cargo units (A)	Cargo unit displacement half way height not more than 8 cm at 20 degree tilt angle, cargo unit holds an adequate pretension when it is tie-down secured.	
Unstable cargo Unit (B)	Cargo unit displacement half way height more than 8 cm at 20 degree tilt angle, cargo unit does not hold an adequate pretension when it is tie-down secured.	



Examples



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- Cargo securing of Big Bags



Procedure to determine the cargo securing which is necessary (Example)

1. Determination of the nature of the bulk cargo using the specification, in particular the gradient angle,
2. assignment of wrapping,
3. determination of transport stability, for this purpose execution of a cargo unit test, for example static tilt test or dynamic tilt test (horizontal impact),
4. choosing of method for cargo securing from table,
5. other methods not included in the table have to be validated by driving tests,
6. the single steps have to be recorded in adequate manner.

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Example form-lock securing method

- Quick loading and unloading
- High safety level



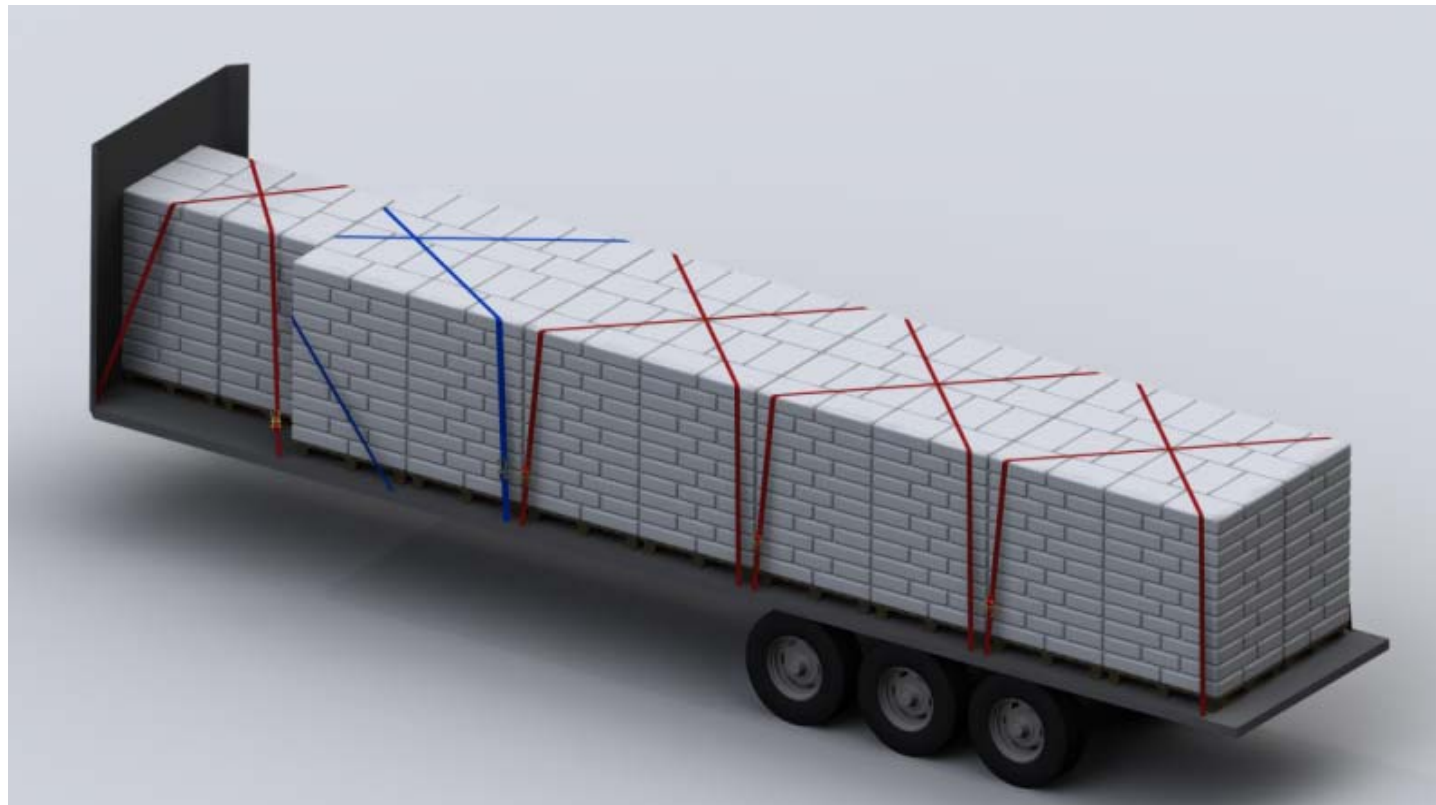
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Example of cargo securing by form-locking / cross-over-lashing

- Loader must be instructed



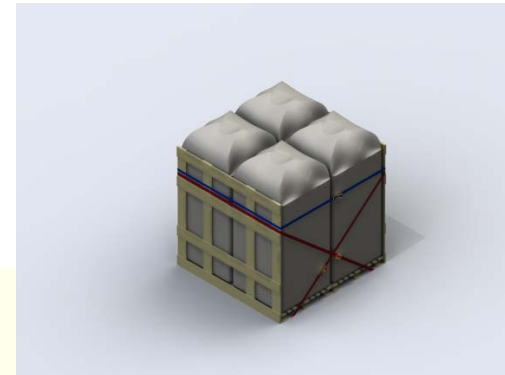
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Example: Form-locked cargo securing (direct lashing / diagonal lashing)

- Loader must be instructed



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Example: Tie-down lashing

- Pretension must hold



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Retaining lashing – Kind of tie-down lashing by vertical loop

The retaining lashing is a supplement to the cargo securing function tie-down lashing having the following characteristics:

Conservation of

- Friction between the contact surfaces
- Securing against tilting



Due to the limitation of the free space in upward direction the friction between the cargo carrier and the surface of the loading space is actively held. In practice there are products showing a behaviour of their particles which is exceedingly inert and therefore late reactive only.

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- Cargo securing of Big Bags



Free spaces

- Free spaces have to be approvable and innocent. The vehicle superstructure has to be able to absorb the kinetic energy.



**Sum of distances
has to be
checked specifically**

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4. Outlook

- Cargo securing offers cost-saving potential for manufacturers. To this all processes from the filling to the user have to be recognised.
- Cargo securing of Big Bags has to be assessed different compared to the securing of rigid goods. The physical consequences are different and offer relaxation case by case regarding the securing measures.
- Cargo securing offers a big potential for optimisation using vehicle-based techniques.
- The aim is, to meet minimum standards of the cargo securing for the products. Furthermore the economic objectives of the business have to be recognized.



Characteristics Wolfgang Neumann

- Forensic expert Ö.b.u.v. expert for wrapping and cargo securing
- EURO EXPERTS EU certified expert for traffic on land, water and in the air regarding cargo securing, wrapping, creation of cargo units and for the assessment of damage and causes
- DVR moderator German Road Safety Council (1999)
DIN-EN/ISO/IEC 17024
- EURO-LAS-T Founder / CEO of the European Expert Union for Cargo Securing and Transport Safety
- EUROSAFE CEO, head quarter location in Hanau
- VDI Member of guideline working group 308.2
Convenor VDI 2700 Part 18
- EU Projects CARING; C.A.S.H

Thank you very much for your attention!



Wolfgang Neumann