

# Making tyre transport safe

**wdk-Guideline 223**

**Klettwitz, 23 October 2013**

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wdk – Wirtschaftsverband der deutschen Kautschukindustrie e. V.

- wdk introduction
- Survey on tyre transports
- Initiative of German tyre manufacturers
- Objectives of the tyre manufacturers involved
- Content of Guideline 223
- Road trials at DEKRA
- Implementation of the Guideline
- Outlook
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## wdk figures



wdk is the organization of the German tyre manufacturers and the producers of general rubber goods.

<b>120 member companies</b>	<b>Employees</b>	<b>Turnover 2012 billion €</b>	<b>Turnover + / -</b>
<b>84</b> rubber manufacturers	70,000	11.7	-2.5
<b>78</b> producers of general rubber goods		6.2	+0.3
<b>6</b> tyre manufacturers on 15 production sites		5.5	-5.4
<b>36</b> suppliers			

More details: [www.wdk.de](http://www.wdk.de)

# Tyre manufactures involved in the project

wdk



**GOODYEAR DUNLOP**  
GERMANY

**BRIDGESTONE**



15 Production sites 93.6 Million new tyres per year

- car tyres 80,000,000 units
- tyres for light trucks and SUV\* 9,690,000 units
- heavy truck tyres 5,550,000 units
- retreaded tyres for heavy trucks 1,160,000 units
- + import
- + transit

\* sport and utility vehicles

# Survey on tyre transports

# Initial situation



Vehicles in insufficient condition

No or inadequate devices for cargo securing



# Initial situation

wdk

Roadside check Bruchsal,  
10 July 2012



Width ~ 2.80 m  
3 side slats per field  
reloading, fine 3,200 €

Missing clearness of „roadworthy transport of vehicle tyres“

- Individual certificates
- Experiences, established practice
- Estimations, expert opinions, predications
- law suits





- Improvement of vehicle quality
- Improvement of loading technique
- Use of adequate cargo securing

**Zero complaints**



# Initiative of the wolk tyre manufacturers

- Improvement of vehicle quality
- Equipment for cargo securing completely and intact
- Safety when loading/unloading (workers protection)
- Safe transport
- Defined standards for loading/unloading staff
- No complaints with the cargo
- Legal certainty for shippers, carriers, inspection bodies

**Safe** transport of vehicle tyres

**Definition of a technical standard  
→ wdk-Guideline**


**Certification**

**Communication**

**Implementation**

# Expert Group Securing Tyre Transport



<p><b>Minimum requirements on load securing of vehicle tyre transport on roads Principles, requirements on vehicles and load securing equipment</b></p>	 <b>223</b> Sheet 1
<p><b>Foreword</b></p> <p>This wdk guideline is based on the laws of physics and the legal regulations</p>	

- Describes:** State of the art
- Consistent rules for loading/unloading
- Defines:** Tyres are a break bulk cargo
- Area of application: Germany
- Terms and definitions

# Minimum Requirements Vehicle



**Tarpaulin vehicles** (Curtainsider) have to be equipped completely with side slats

**Tarpaulins** in line with DIN EN 12641, undamaged or professionally repaired [protection against weather impacts, pollution – no function as cargo securing device!]

**Side slats** are not bent, crushed, cracked, ruptured, slivered, without knotholes, without extensive resin galls

**Head board** minimum code L (DIN EN 12642), depending on payload also code XL

# Minimum Requirements Cargo Securing Equipment



**Lashing straps** (DIN EN 12195-2) polyester belt webbing (LC 2,500 daN) with short-/long-lever brace, standard force-/ long lever pull brace and hooks

**Disposable lashings** for laterally buckling, specification and use depending on tyre types and loading → part 2

**Locking beams** securing rearward when partially/fully stowed

**Stop bar** (in line with DIN EN 12642 or equal stability) mandatory for cargo carriers

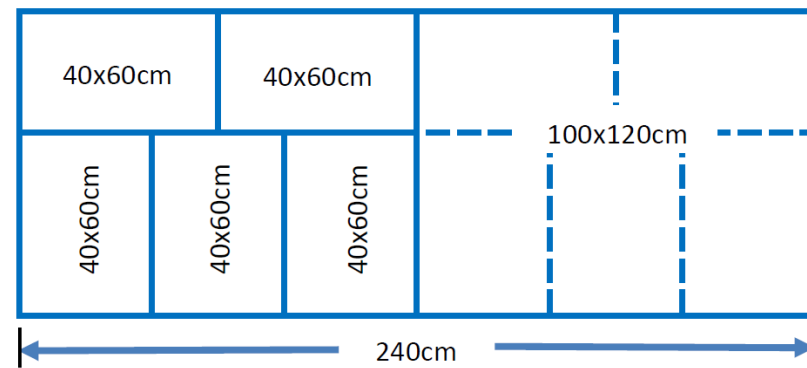


# Minimum Requirements Measures for Cargo Securing



## Tightly packed cargo

- tight packing of the cargo units among each other
- tight packing to the vehicle body side walls: Multiple to modular measure grating (40x60 cm)  
VDI 2700, 2.3



**Securing** against slipping/tipping over [≠ paper / paper boards / plastic foils]

Observation of **vehicle width** 2,550 mm / **-height** 4,000 mm, of the vehicle dimensions related to construction and model

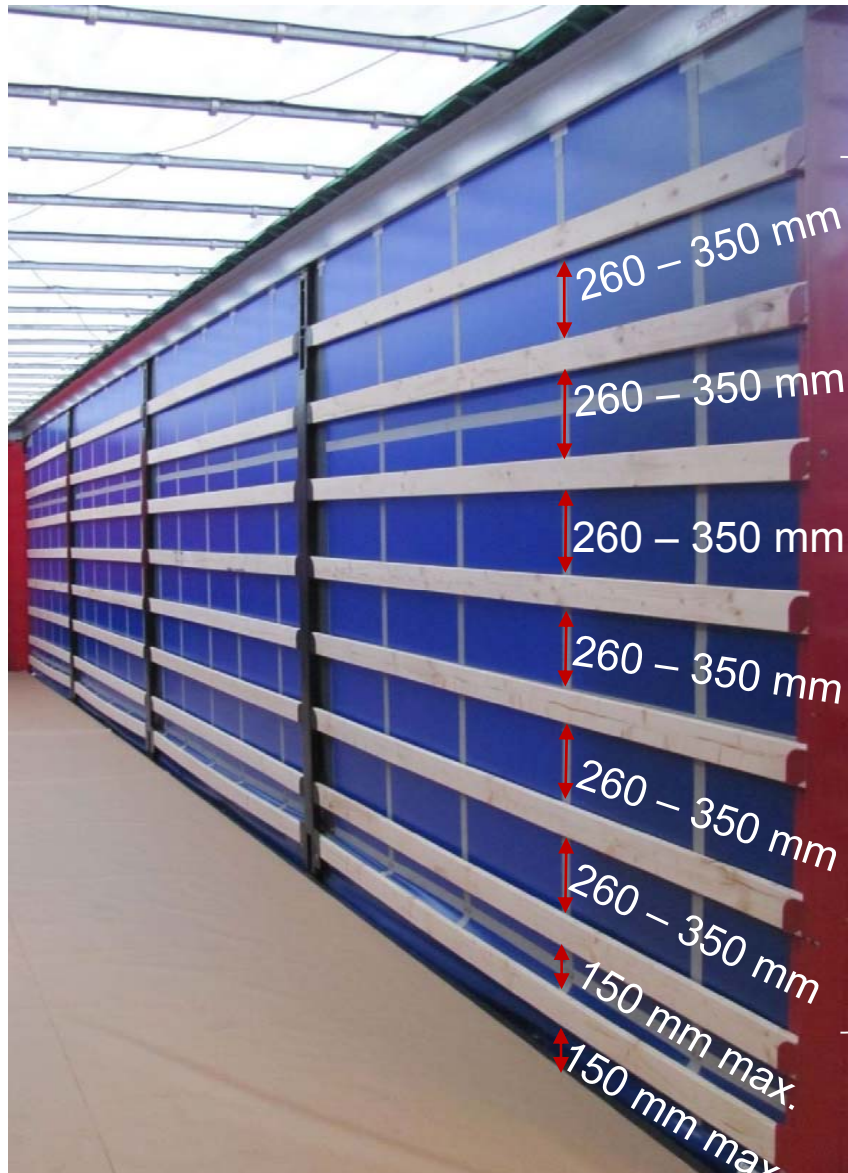
<b>Mindestanforderungen an die Ladungssicherung für den Transport von Fahrzeugreifen im Straßenverkehr Pkw-, Lkw-, Lkw-Reifen sowie Zweiradreifen und Karkassen</b>			<b>223</b> Blatt 2	
	<b>Cargo:</b>	<b>Tyres/Carcasses</b>		
	Interwoven	Car	LT*	Motorbike
Vorv	Interwoven + diff. load heights	Car	LT*	Motorbike
Vora Blatt	Piled	Car	LT*	Truck**
Ladu	Piled + diff. load heights	Car	LT*	Truck**

Car, LT , motorbike tyres: Outer diameter 500 – 900 mm

Body stability according to DIN EN 12642 Code XL Annex A

\*) LGV: Light Goods Vehicle up to 7.5t    \*\*) Truck: from 7.5 t /total weight on

# Positioning of Side Slags



vertical distances

Variable according to tyre dimensions:

- small, narrow tyres = small distances
- big, wide tyres = big distances

Always to meet

# Non-returnable restraint assembly

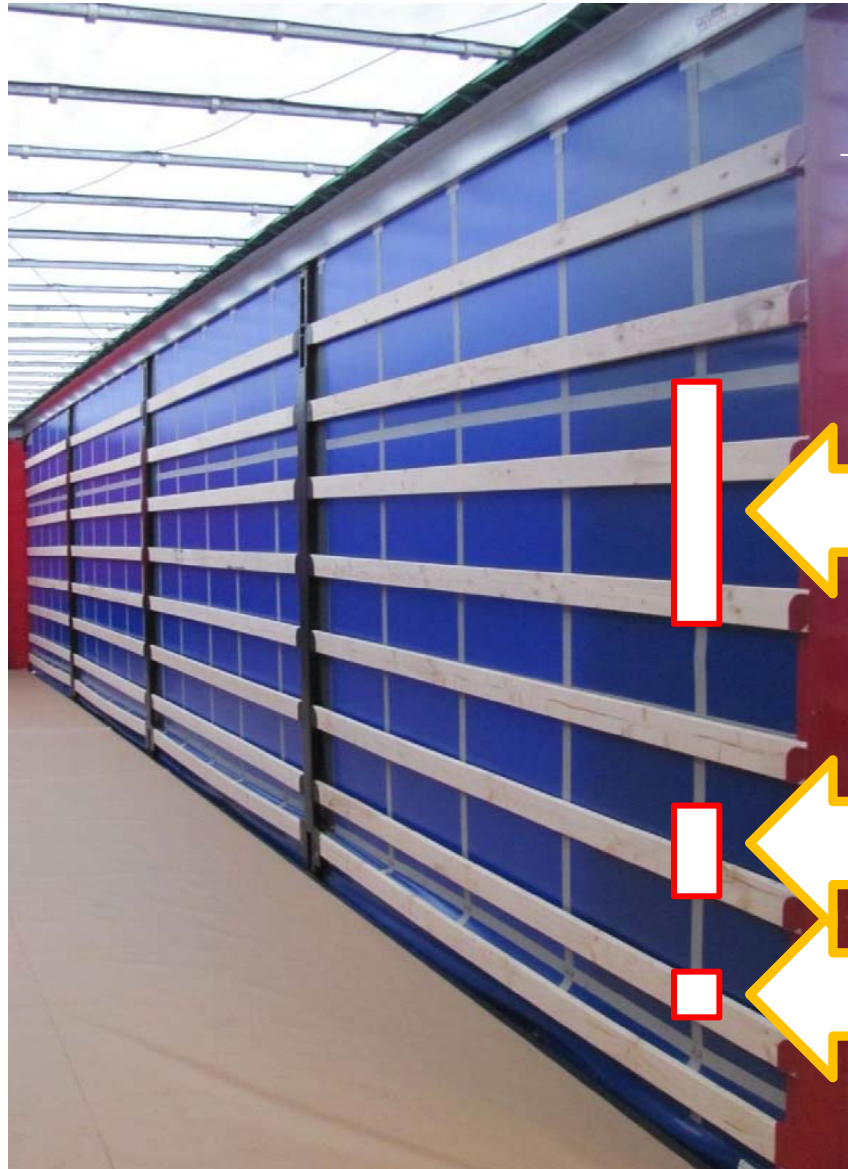


**disposable lashings**  
e.g. Type EasyLash®  
(2.500 daN in loop strapping)

**Polypropylene (PP)-cord  
double laying**  
Tear resistance 120 daN  
(e.g. manufacturer Hanfwolf  
TYP MNM 032/single)



# Lateral stabilisation - interwoven



Interwoven loaded tyres:  
Lateral (in direction of travel)  
stabilisation of the side slags  
in separate zones as marked:

1480 – 1825 mm

760 – 875 mm

400 – 425 mm

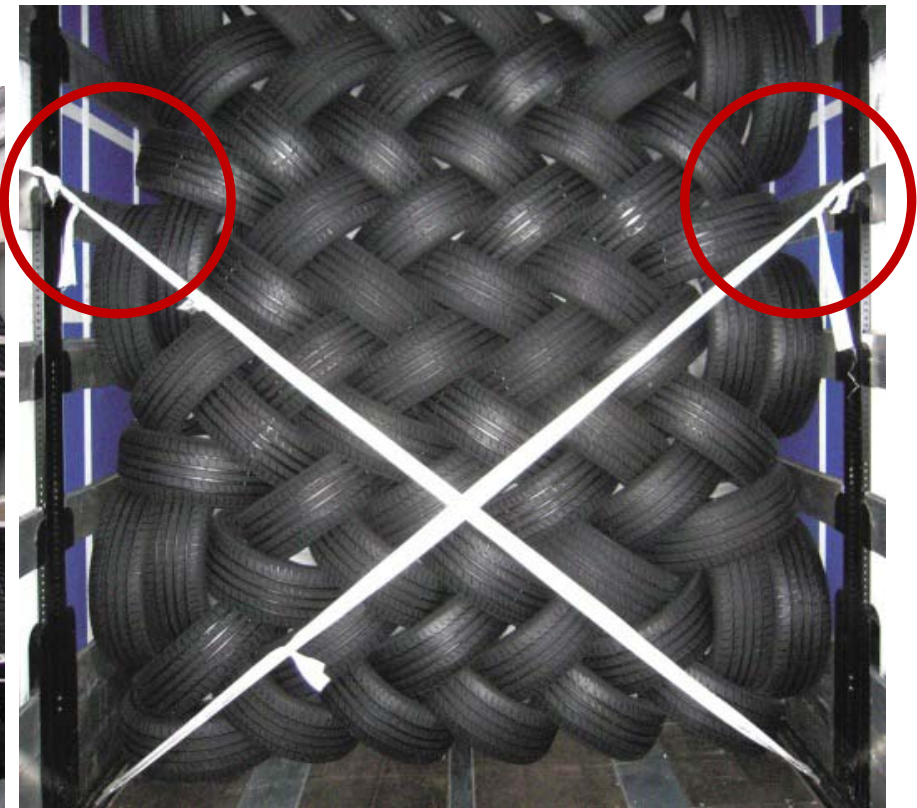
Distances measured  
from vehicle floor

# Bracing [Tyres interwoven] Side slags & Stakes



**Side slags** in every stanchion field, height approx. 400 - 425 mm, 760 - 875 mm and 1.480 - 1.825 mm, lateral, almost midway between 2 stakes, bracing

Bracing **stakes** diagonally, height approx. 1,480 -2,775 mm, in the lashing points according to DIN EN 12640.



disposable lashings type EasyLash® (2,500 daN in loop strapping) or double PP-Cord (Hanfwolf Type MNM 032/single, elongation at break 120 daN)

50 mm lashing straps in line with DIN EN 12195-2, LC 2,500 daN

# Lateral stabilization – piled



Piled tyres: Lateral (in direction of travel) stabilisation of the side slags in the zone as marked:

From 900 mm on

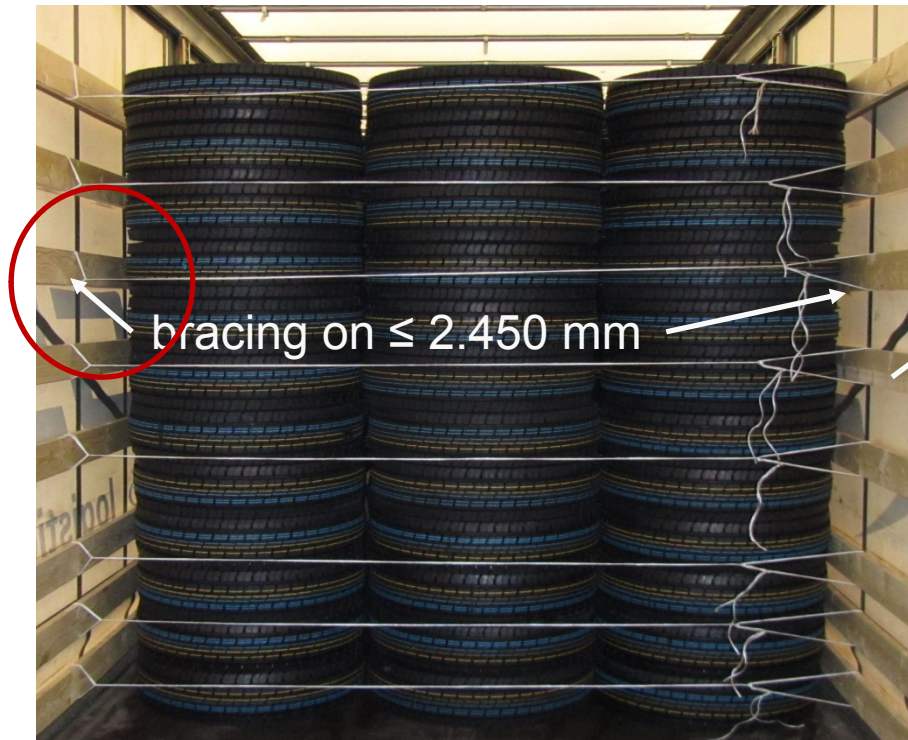


# Bracing [Tyres piled] Side slags & Stakes



**Side slags** in every stanchion field, height from approx. 900 mm to top layer, lateral, almost midway between 2 stakes, braced.

Bracing **stakes** diagonally, height approx. 1,480 -2,775 mm, in the lashing points according to DIN EN 12640.

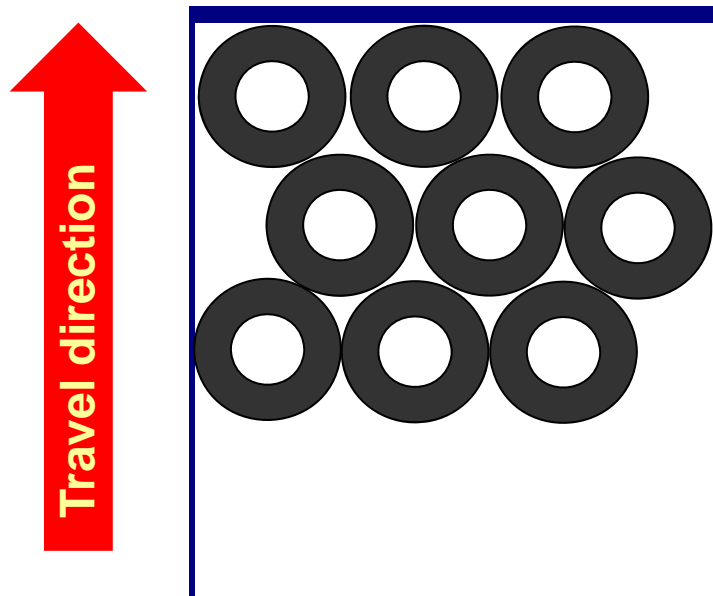


disposable lashings type EasyLash® (2,500 daN in loop strapping) or double PP-cord (Hanfwolf TYP MNM 032/single, elongation at break 120 daN

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# Loading Example Piled



Tightly packed at the head board. If the tyre columns placed side-by-side do not fill the whole widths of the vehicle body, the rows have to be stowed in an offset pattern (“on the gaps”).

The outer tyres of the topmost layer must always be supported by a side slag or the roof beam.

## Rear Securing

Top layer to be secured using a disposable lashing strap.



Diagonally crossed belts using 2 lashing straps which are hooked left and right in traveling direction into the lashing points of the vehicle. The straps are passed over the outermost tyre columns hooked into the lashing points of the vehicle and finally tensioned.

# Road Trials at DEKRA



- Volume vehicles: 3 m height, 3 side stakes, vehicle body structure stability in line with DIN EN 12642 Code XL Annex A
- Loads:
  - Test 1: 1/1 car interwoven
  - Test 2: 1/2 truck piled, 1/2 LT piled
  - Test 3: 1/2 car interwoven, 1/2 motorbike interwoven
- Pre conditioning: 500 km Motorway / through roads
- Dynamic driving test in line with DIN EN 12642 Code XL Annex B
- Execution DEKRA techn. dept. Vehicle Technique / Accident Analyses / Cargo Securing
- Site: Büren (Westphalia), 20 – 24 February 2012

# Results



Curtainsiders are adequate to transport tyres which are loosely stowed.

Side slats made from wood can be used → quality features, bracing.



Minimum requirements described in wdk-Guideline 223 part 1+2 must be met.

**= safe transport of vehicle tyres**

# Implementation of Guideline 223

# Current Status



- Certification by DEKRA



Richtlinie 223 as of August 2012 published



Guideline 223 as of January 2013 published



Ligne-guide 223 as of January 2013 published

- To be ordered at [c.naehrig@wdk.de](mailto:c.naehrig@wdk.de)



## **Users:**

- Tyre manufacturers
- Tyre seller (no priority)
- Hauliers, forwarders
- Logistics service providers
- Experts
- OEMs

## **Inspection bodies:**

- Police, preferential motorway police
- BAG (Federal agency for cargo transport)



## wdk PRESSE

- Press release
- Articles in trade magazines
- Link wdk-Homepage → source of supply
- Brochure



## **Depending on**

- Level of information by forwarders / shippers
- Disposability of vehicles

**The tyre manufacturers are working on a speedy implementation in an adequate time frame.**

## **Transit traffic**

- Not all of the transports start at a loading site of a tyre manufacturer
- Implementation at foreign loading sites often difficult due to authorisation.

# Outlook



## **Expert group tyre transport safety:**

- Exchange of experiences after ~1 year of practice
- Demand for amendments / changes

## **Cooperation with WG cargo securing at BGL:**

- Implementation into handbook cargo securing

## **Field manual correct interwoving**

## **European standard**

- Implementation at EU tyre manufacturers
- European Tyre & Rubber Manufacturers' Association ETRMA



Many thanks for your interest



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