

# Load-securing device



Product competence from EUROPART

- Lashing straps
- Accessories for lashing straps
- Safety nets
- Non-slip mats
- Blocking elements
- Lashing chains
- Lashing points
- Tarpaulins/fastening chains
- Sling bands/round slings
- Load securing for the van
- Hazardous goods transport



**EUROPART – Europe's No. 1 for truck, trailer, van and bus spare parts.**

# The legal context



A variety of laws, regulations and directives control load security, for instance the Road Traffic Order (StVO), the Road Traffic Licensing Order (StVZO), the Accident Prevention Regulations (UVV) as well as sets of technical rules such as VDI 2700 ff. and DIN EN 12195 -1 to -4.

## Important paragraphs:

### § 22 StVO „Loading”

(1) The load, including devices for securing the load, as well as the loading equipment, must be stored and secured so that they cannot slide, topple, roll back and forth, fall off or create avoidable noise during full braking or sudden evasive movement. In doing so, the recognised rules of the technology must be respected.

### § 23 StVO „Other duties of the vehicle driver”

(1) Whoever drives a vehicle is responsible for ensuring that his/her sight and hearing are not adversely affected by the occupants, animals, load, devices or the condition of the vehicle. Whoever drives a vehicle must in addition ensure that the vehicle, train, truck/train combination as well as the load and the occupants are according to regulations and that the roadworthiness of the vehicle does not suffer due to the load or occupants.

### § 31 StVZO „Responsibility for the operation of the vehicle”

(2) The keeper must not order or permit operation if it is known to him or should be known to him that (...) the vehicle or (...) the load (...) is not according to regulations or the safety of the vehicle suffers due to the load (...).

According to police findings during controls on trucks, the area of load securing is the **most common fault** after failure to observe driving periods and rest periods.

According to DEKRA, **a quarter of all truck accidents** are traced back to failings in securing the load.

According to estimates by the German Insurance Association (GDV), **yearly losses of at least 240 million Euros** arise through accidents that are caused by faulty load securing.

## The safety of the load is the responsibility of all those involved:

The **vehicle keeper** is obliged to provide a suitable vehicle driver, and equally so a vehicle in the proper condition and with the correct equipment. Should the sender or loader be in doubt about the intended transport, he is obliged to reject the vehicle.

The **driver** of the vehicle must ensure that the load is safe for operation of the vehicle. Care must be taken here that

- the vehicle is not impaired (ability to steer, stability) by the load,
- permitted dimensions, total weight and axle loads are taken into account (load distribution plan),
- a test of the load security measures is undertaken before departure as well as underway, if necessary the means of lashing must be retightened etc.

The **shipper and common carrier** is responsible for the secure carriage of the load and thus specifically for

- packaging that is suitable for the goods and the transportation route,
- proper labelling of the load,
- formation of suitable load units (pallets, lattice boxes, containers etc.),
- stowage of the load in the loading space,
- the attachment and security of the load on the vehicle,
- the proper use of lifting trucks, cranes etc.

Breach of these regulations can lead to sanctions in the form of fines, immobilisation of the vehicle to criminal consequences.

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## EUROPART focuses on safety during transport

### Load securing - an important topic

Proper securing of the load on commercial vehicles is the deciding factor in ensuring high quality transportation with the protection of persons and goods.

The term load securing serves as a broad term describing how the load is secured against the physical forces of movement that occur during transport. Distinctions are made here between:

- during acceleration: forces towards the rear
- during braking: forces in the direction of travel
- during cornering: forces towards the side
- particularly on uneven roads: vertical forces

The simplest form of load securing is the use of the loading area walls of the vehicle. Here the load is directly fitted to the side walls as well as the front and rear walls and thus cannot slide (known as form-fit loading). However, in many cases this is not possible because of the required load distribution and the kind of goods being carried, so that aids to secure the load must be employed. The use of certified, robust and reliable attachment systems that guarantee sufficient safety for the freight is the deciding factor here.



**EUROPART offers a comprehensive portfolio of products so that you can safely and professionally secure and transport your goods.**





# Lashing straps

The most widely used type of load securing is lashing the load. As a rule, lashing straps are used to do this. They are particularly suitable for securing delicate goods.

**Short lever ratchets**, also known as push ratchets, usually achieve a preload force of up to 350 daN. With a **long lever ratchet** (pull ratchet), a preload force of 500 daN and more can be achieved.

The lashing straps with ratchet from **EUROPART** (also known as two-part lashing straps or lashing strap set) are made of **robust polyester** which is **insensitive to acids, oils and greases**. Temperatures of -40 to +100 °C also have no effect on the properties of the material. The normal preload force of the lashing straps is between 300 and 600 daN and the permitted stretched tensile force 2500 daN, in strapping 5000 daN.



with EUROPART logo



## Ratchet strap

Version	with fixing rail fittings and push ratchet
Width	50 mm
Length	3500 mm
Fixed end	1200 mm
Loose end	2300 mm
Colour	red
Material	Polyester (PES)
Standard	EN 12195-2

Permissible tensile force 750 daN stretched, 1500 daN in the strapping.

**Scope of supply**  
2-piece

Order no.

9690 000 042



This figure corresponds to 9690 900 003

## Loose end

Width	50 mm
Colour	red
Material	Polyester (PES)
Standard	EN 12195-2

permissible tensile force 2500 daN stretched, 5000 daN in the strapping

with **EUROPART** logo

Version	Length	Order no.
with profile hook	7500 mm	9690 900 002
with profile hook	9500 mm	9690 900 001
with snap hook	7500 mm	9690 900 003
with profile hook	11500 mm	9690 900 005



## Ratchet strap

Version	with U profile hook and pull ratchet
Width	50 mm
Length	8000 mm
Fixed end	500 mm
Loose end	7500 mm
Colour	orange
Material	polyester (PES)
Standard	DIN-EN 12195-2

permissible tensile force 2500 daN stretched, 5000 daN in strapping

**Scope of supply**  
2-piece

Order no.

9690 515 078

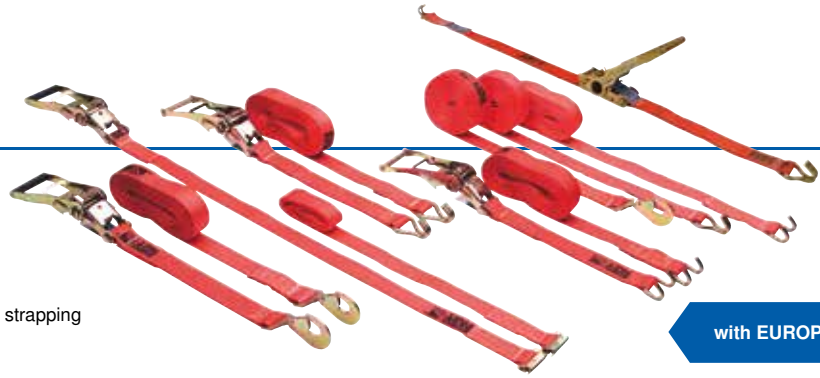


## Ratchet strap

Width 50 mm  
Colour red  
Material Polyester (PES)  
Standard EN 12195-2

permissible tensile force 2500 daN stretched, 5000 daN in the strapping

**Scope of supply**  
2-piece



with EURO PART logo

Version	Length	Fixed end	Loose end	Pre-tension force	Order no.
with profile hook and push ratchet	8000 mm	500 mm	7500 mm	300 daN	9690 000 030
with profile hook and push ratchet	10000 mm	500 mm	9500 mm	300 daN	9194 510 000
with profile hook and push ratchet	12000 mm	500 mm	11500 mm	300 daN	9690 000 184
with profile hook and pull ratchet	8000 mm	500 mm	7500 mm	600 daN	9690 515 036
with profile hook and pull ratchet	10000 mm	500 mm	9500 mm	600 daN	9690 515 038
with U profile hook and push ratchet	8000 mm	500 mm	7500 mm	300 daN	9690 000 027
with spring hook and push ratchet	8000 mm	500 mm	7500 mm	300 daN	9690 000 028

## Dolezych

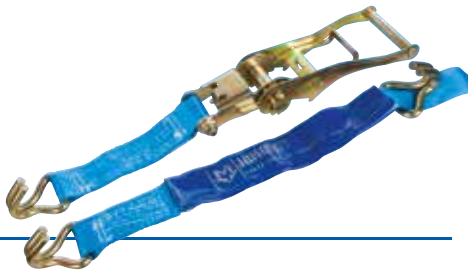
### Ratchet strap

Version with profile hook and push ratchet  
Colour blue  
Material polyester (PES)  
Standard DIN-EN 12195-2

permitted tensile force 1500 daN stretched, 3000 daN in strapping

**Application range**  
for car transportation

Width	Length	Fixed end	Loose end	Order no.
50 mm	2000 mm	200 mm	1800 mm	9690 501 533
35 mm	2600 mm	150 mm	2450 mm	9690 351 533



## Dolezych

### Ratchet strap

Version with fixing rail fittings and push ratchet  
Width 50 mm  
Colour red  
Material polyester (PES)  
Standard EN 12195-2

permissible tensile force 750 daN stretched, 1500 daN in strapping

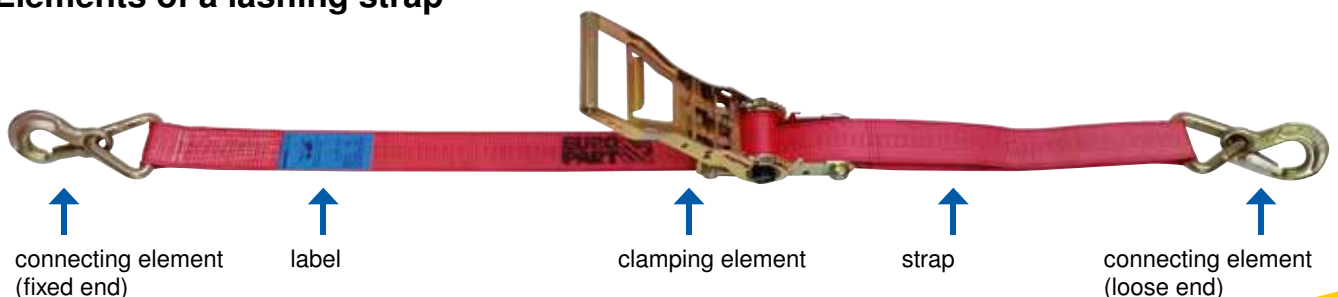
**Scope of supply**  
2-piece

Length	Fixed end	Loose end	Order no.
4500 mm	500 mm	4000 mm	9690 000 024
4800 mm	1200 mm	3600 mm	9698 264 812
5000 mm	1200 mm	3800 mm	9690 511 534



(Illustration similar)

## Elements of a lashing strap



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Dolezych

Ratchet strap  
PowerLash GTR 75

Width 75 mm  
Fixed end 700 mm  
Loose end 1800 mm  
Colour orange  
Standard EN 12195-2

permissible tensile force 5000 daN stretched, 10000 daN in strapping  
**only suitable for direct lashing**



Version	Length	Order no.
with eye hook/wide mouth hook and pull ratchet	2500 mm	9696 760 006
with triangular snap hook and pull ratchet	4000 mm	9697 600 002



Dolezych

Ratchet strap

Version with profile hook and push ratchet  
Width 75 mm  
Colour orange  
Material polyester (PES)  
Standard EN 12195-2

permissible tensile force 5000 daN stretched, 10000 daN in the strapping

**Scope of supply**  
2-piece

**only suitable for direct lashing**

Length	Fixed end	Loose end	Order no.
4000 mm	700 mm	3300 mm	6926 750 034
6000 mm	500 mm	5500 mm	9690 505 034
8000 mm	700 mm	7300 mm	9690 750 034

(Illustration similar)



Ratchet strap

Version with drop side clamp and lever turnbuckle  
Width 45 mm  
Length 3600 mm  
Standard EN 12195-2

**Application range**  
especially for secure anchorage of small loads at any position on the board wall

Order no.
9690 790 140

Replacement state of lashing straps

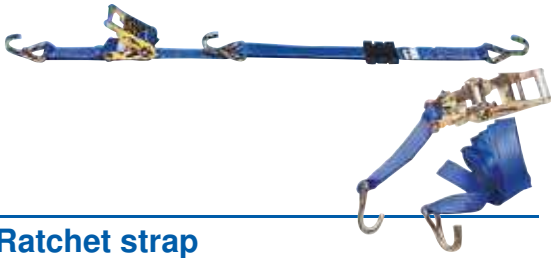
Lashing straps undergo mechanical wear and must be substituted when they reach the replacement state.

**A lashing strap is in the replacement state when it has:**

- yarn breaks and cuts over more than 10 % of the width of the strap, or other serious cuts
- damage to the seams, fibres, or indentations
- distortions caused by heat
- damage to the hooks, distortions, splits or fractures on the metal parts
- distortions of the ratchet
- excessive wear or damage caused by aggressive substances (chemicals)
- illegible or missing label



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## Ratchet strap

Version	with profile hook and push ratchet
Width	35 mm
Length	2000 mm
Fixed end	200 mm
Loose end	1800 mm
Colour	blue
Material	Polyester (PES)
Standard	EN 12195-2

permitted tensile force 1500 daN stretched, 3000 daN in the strapping.

### Scope of supply

2-piece

### Application range

for car transportation

Order no.

9690 000 045

## Ratchet strap

Version	with profile hook and push ratchet
Width	35 mm
Length	4000 mm
Fixed end	300 mm
Loose end	3700 mm
Colour	green
Material	polyester (PES)
Standard	EN 12195-2

Permissible tensile force 1000 daN stretched, 2000 daN in the strapping.

### Scope of supply

2-piece

Order no.

9690 352 056



## Dolezych

## Ratchet strap

Version	with profile hook and push ratchet
Width	25 mm
Length	2000 mm
Fixed end	300 mm
Loose end	3700 mm
Colour	red
Material	polyester
Standard	EN 12195-2

permitted tensile force 350 daN stretched, 700 daN in the strapping

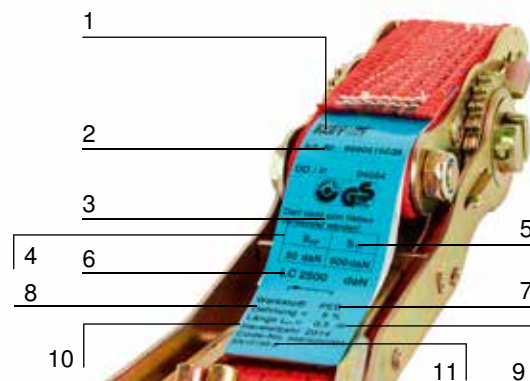
Order no.

9690 250 736

## Labelling of lashing straps

The label that is secured to every certified lashing strap contains the following information:

1. Name of the manufacturer of the lashing strap
2. Article identification number/tracing code
3. Designated use
4. SHF – Standard Hand Force - the manual force that may act on the lever of the ratchet. The standard value is 50 daN = 50 kg. Application of a higher force on the lever of the ratchet could damage it.
5. STF – Standard Tension Force (normally the preload force of the lashing strap) is the force with which the load is pressed down onto the loading floor. Important when lashing down. The higher the preload force, the fewer load securing devices must be used.
6. LC – Lashing Capacity - the loadability of the strap. Important when direct lashing. If it is 2500 daN (2500 kg) in direct tension, this means that with the load secured by a simple tensile force, it may weigh a maximum of 2,5 t.
7. Designation of the material from which the lashing strap is made (PES - robust polyester)
8. Stretchability of the lashing strap during use – the maximum elongation of the material from which the strap was woven, is a maximum of 7 %
9. LG – Length. LGL – length, that which was measured from the label of the lashing strap (9.5 m), LGF – length, that which was measured from the ratchet of the lashing strap (0.5 m)
10. Year of manufacture of the lashing strap
11. Declaration of conformity according to the EU standard EN 12195-2, which ensures the high quality and safety in use of the lashing strap



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## Direct lashing

Even the **heaviest loads** can be safely tied down with the aid of the form-fitting process of „direct lashing“. Direct lashing can be used in **various forms**, depending on the nature of the load. The required securing forces are created during the journey through offset loading. During the calculation, the **permitted lashing capacity (LC) in direct tension** is taken as a basis, so that the means of lashing directly absorb the forces created by the movements of the vehicle (acceleration, deceleration and centrifugal forces). With this type of lashing, each load securing device is secured between the lashing points on the truck and the load fastening points of the load. In contrast to lashing down, when direct lashing is used, the straps are **tightened only hand tight (with a max. of 10 % of the LC)**, so that the permitted lashing capacity (LC) is not already reduced by the high pretension forces.

## Inclined lashing

At least **eight load securing devices** are always required for inclined lashing.

These load securing devices are spanned from the load to the loading surface so that there are right-angles ( $\beta = 90^\circ$ ) to all four edges of the loading surface.



## Diagonal lashing

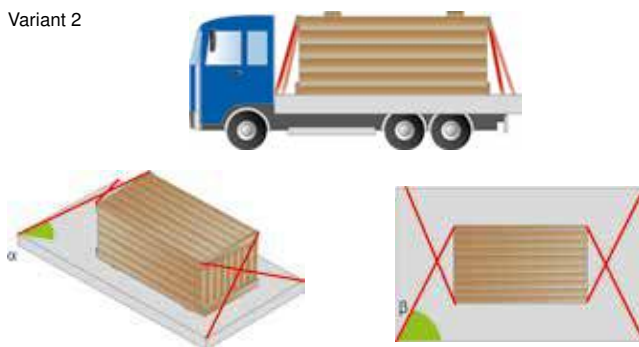
Diagonal lashing can be done in various ways. In doing so, four load securing devices are always needed.

Variant 1



Variants 1 and 2 can be combined.

Variant 2



Variant 3



**Lashing angle:** The necessary permitted tensile force of the load securing device during direct lashing depends on the **lashing angles  $\alpha$  and  $\beta$** . Lashing angle  $\alpha$  is the **vertical angle** between the loading surface and the load securing device. It should be in the range 20 to 65°. The **horizontal angle  $\beta$**  is the angle between the vehicle longitudinal direction and the load securing device, this should be in the range 6 to 55°.

The best values for securing forces can be calculated when the two angles  $\alpha$  and  $\beta$  are measured using a **protractor**. In doing so, it often arises that load securing devices with smaller dimensions can be used or, higher load weights can be secured using the same load securing devices.



## Head lashing

Head lashing is used as „**bulkhead substitute**“, if the load cannot be loaded at the bulkhead because of the load distribution. This is therefore **form-fitting load securing** in the form of a direct lashing. In this type of load securing that is still relatively unknown in traffic, special care must be taken without exception to ensure that the load securing device in front of the portion of the load is always held in its position during transport and **permanently fixed to the vehicle**.

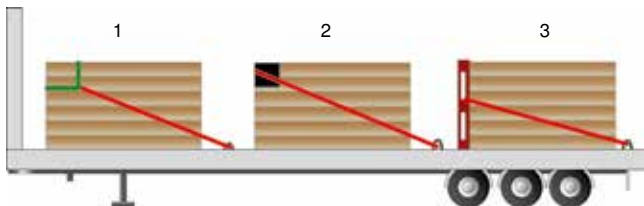
### Head lashing can be created according to the following principles:

1. A **round sling** (lifting strap) is laid around the front (in the direction of travel) edge of the load. On each side of the load, a load securing device is hooked into this round sling and connected to the vehicle at a lashing point on the loading surface (Fig. 1).
2. One **edge attachment** each is laid on the left and right front (in the direction of travel) upper edges of the load. This edge attachment serves as support for the load securing device that is now taken from a lashing point on the left side of the load, held through the edge attachment, led to a lashing point on the right side of the load and connected to the vehicle in this way (Fig. 2).
3. Alternatively, a **pallet** standing on edge can also be used (Fig. 3). The means of load securing then takes effect in strapping.

Fig.1 round sling

Fig. 2 edge attachment

Fig. 3 pallet



## Lashing down

The most often used type of load securing is lashing down. In doing so, the load is **friction-locked** and pressed by the load securing device onto the loading surface, by which the „micro interlocking“ and thus the friction is increased. The **frictional force** holds the load tight on the loading surface. During lashing down, the load securing device is guided by spanning over the top of the load at both sides of the load - if possible in the lashing points - hooked into the loading surface and tightened with the clamping element (e.g. a ratchet). The term „**preload force**“ describes the force that the load securing device exerts on the load. In doing so, it is only applied by the clamping element of the load securing device.

**Lashing angle:** As well as the preload force of the ratchet, decisive for the preload force of a load securing device is the lashing angle  $\alpha$ . This lashing angle is measured at the perpendicular between the loading surface and the load securing device. The lashing angle greatly influences the effective preload force of the securing device being used. **The smaller the lashing angle  $\alpha$ , the lower is the effective preload force.**

An **optimum preload force** of the load securing device is achieved with a lashing angle  $\alpha$  of  $90^\circ$ .

**When lashing down, a lashing angle of less than  $30^\circ$  should be avoided.**

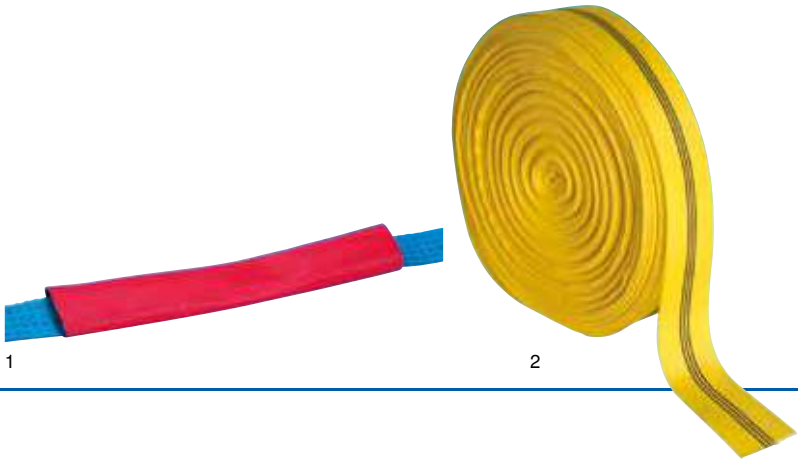


Requirement for safe lashing is always a "swept clean" load area.



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# Accessories for lashing straps



## Protective hose

suitable as edge protection

suitable for	Length	Material	Fig.	Order no.
lashing strap, width of strap 25 mm	500 mm	PVC	1	9534 434 602
lashing strap, width of strap 35 mm	500 mm	PVC	1	9695 000 050
lashing strap, width of strap 50 mm	500 mm	PVC	1	9534 434 603
lashing strap, width of strap 50 mm	by the metre	polyester	2	9690 000 711



## Load securing system

**Application range**  
suitable for all soft packaging with surging movements, such as Oktatainers, bagged goods in shrink film on pallets, drink bins, BigBags and other cargo that is not suitable for lashing

Scope of supply	Order no.
with loose ends	9690 000 040
with built-in ratchets and loose-strung profile hooks	9690 000 041



## Dolezych

### Load securing disc Trucker's Disc

quickly and easily determine the correct number of straps, suitable for various loads, vehicle floors, lashing angles and lashing means

**Application range**  
for lashing down and diagonal straps  
**Help in practice for all occasions!**

Order no.
9690 699 999



## Dolezych

### Load securing bag for transporting tubes

Width 280 mm  
Height 100 mm  
Depth 400 mm

Order no.
9690 990 043

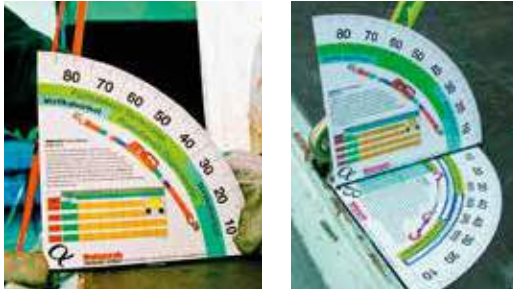


## Dolezych

### Safe transport

**Application range**  
for transporting gas bottles horizontally

Description	Order no.
for gas bottles with 10 litre contents	9690 002 032
for gas bottles with 20/50 litre contents	9690 002 050



## Goniometer set

### to secure loads

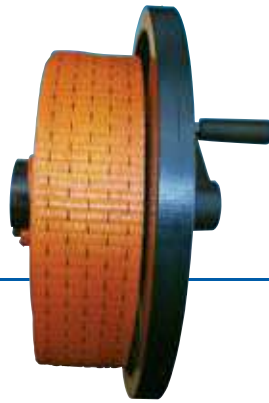
for determination of the vertical angles  $\alpha$  and  $\beta$

Order no.

9506 999 990

The lashing angle has a large effect on the preload force when lashing down. It is measured between the loading surface and the load securing device. The steeper the angle, the more preload force can be applied to the load. The ideal run of the strap is nearly vertical.

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## Releasing reel

for convenient and fast rolling up of 50 mm loose ends, when rolled up, loose ends can be more easily stowed, take up less space and are more quickly ready for use again

**Application range**  
for 50 mm strap

Order no.

9696 000 078

## Dolezych

### Lashing capacity gauge

Surface galvanised



Order no.

9690 504 031

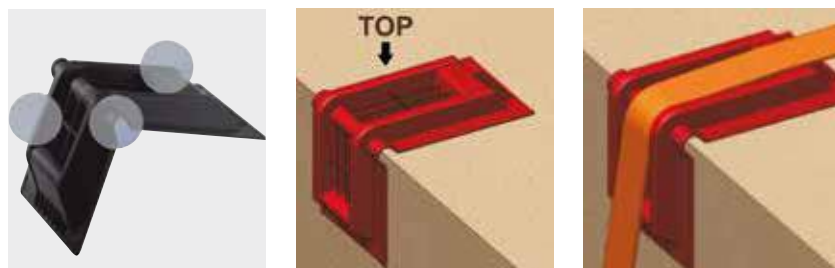




## Edge protection corners

Operating instructions: Edge protection corners should always be used to avoid the risk of damage to the load or the lashing straps. The edge protection is placed on the load so that the longer side plate is located at the top (TOP) and the shorter is towards the bottom, aligned along the side wall (Fig. 1). The lashing strap must be applied so that it lies exactly in the middle of the edge protection and is secured through the lateral guide (Fig. 2). Please pay attention that there are no tensioning or connecting elements such as sprockets, turnbuckles, hooks etc. on the lashing strap.

DIN EN 12195 and the VDI directive 2701 stipulate that load securing devices must be protected against damage at the edges of the load by edge protectors (also known as corner protectors).



### Edge protection

Dimensions 130 x 95 mm  
Band width 65 mm  
Colour black  
Material Plastic

Version	Order no.
with slot, open	9690 000 230
with slot, closed	9690 000 231



### Edge protection

resistant and flexible

Dimensions 150 x 200 x 170 mm  
Colour black  
Material polypropylene

K-factor is  $\geq 1.78$

**Application range**  
for transporting paper rolls



TÜV-certified

Order no.
9690 000 232



## Dolezych

### Edge protection rail

for all widths of webbing

Dimensions 190 x 190 x 19 mm  
Colour red

**Application range**  
for boxes, pallet cages, stone slabs etc.

**special lengths on request**

Length	Order no.
600 mm	9690 600 360
800 mm	9690 600 370
1000 mm	9690 600 371
1200 mm	9690 600 372
6000 mm	9690 003 007

Lashing straps can become **mechanically damaged**, particularly if the article to be secured has sharp edges. For this reason, edge protection products are essential when securing the load using lashing straps. Edge protection made from elastic materials is placed at the load edges of the article, over which the lashing strap is tightened, **to protect it against chafing**. At the same time it can absorb microvibrations and thus **prevent the strap from slipping**.

The contact surface of the edge protection with the cargo is greater than that of the lashing strap, so that a more even distribution of the preload is achieved. **The edge protection thus prevents not only premature wear of the lashing strap, but it also protects the goods, which equally guarantees higher transport safety.**

**The EUROPART edge protection corners are made of high-quality plastic (PP). They are characterised by:**

- robust construction
- larger surfaces of the side elements which distribute the pressure evenly
- resistance to damage at temperatures between -20 °C to +70 °C
- K-factor is  $\geq 1.78$

## EUROPART GOOD TO KNOW

# Safety nets

## Dolezych

### Load safety net DoKEP®, for trucks

Colour orange  
Material polyester

Version	Tensile strength	Length	Width	Mesh width	Order no.
main netting	1000 daN	4060 mm	3130 mm	280 mm	9696 002 025
extension netting	1000 daN	2200 mm	3130 mm	280 mm	9696 002 026
main netting	2000 daN	4060 mm	3130 mm	280 mm	9696 002 027
extension netting	2000 daN	2200 mm	3130 mm	280 mm	9696 002 028
separating net			2425 mm	175 x 75 mm	9696 000 124
side protection net			2950 mm	300 mm	9696 000 122
side protection net			2950 mm	300 mm	9696 000 123



## Dolezych

### Load safety net DoKEP®

Tensile strength 500 daN  
Band width 25 mm  
Colour orange  
Material polyester

Length	Width	Mesh width	Order no.
2825 mm	1625 mm	175 mm	9696 002 302
2950 mm	1650 mm	300 mm	9696 002 301

Further sizes available on request!

#### Accessories

Description	Order no.
Fastening set, 6 piece set with mini ratchet and 12 x S-hooks	9696 002 380



### Container cover net

a must for environmental protection

Version knotless  
Mesh width 45 mm  
Width 3500 mm  
Thread Ø 3 mm  
Colour green  
Material polypropylene

Length	Order no.
5000 mm	9690 100 000
6000 mm	9690 200 000
7000 mm	9690 300 000
8000 mm	9690 400 000
10000 mm	9690 500 000

# Non-slip mats

In order to achieve **better friction values** and thus prevent the goods to be transported from slipping, **anti-slip mats and floor coverings** are used, among other things. Made of granulate rubber material, they increase the friction between the load and the floor and thus reduce the danger of the load slipping. **They are used in combination with the load securing devices.**

Anti-slip mats can only be effective if the **load surface is free of residues**, such as sand, granule remains etc. The so-called „well-swept“ load surface is a precondition for proper load security. The broom belongs to the standard equipment of a commercial vehicle.



## Non-slip mat

more protection and safety through non-slip effect, better stability

Width	250 mm
Thickness	8 mm
Colour	black
Friction coefficient	0.65 $\mu$

tested by Fraunhofer Institute (see report on right hand page)

Length	Order no.
5000 mm	9690 000 300
10000 mm	9690 000 245



## Non-slip mat

more protection and safety through non-slip effect, better stability

Colour	black
Friction coefficient	0.65 $\mu$

Length	Width	Thickness	Order no.
150 mm	100 mm	3 mm	1195 910 188
200 mm	100 mm	8 mm	1195 900 055
200 mm	100 mm	10 mm	1195 900 092
250 mm	200 mm	8 mm	9690 000 186
300 mm	200 mm	10 mm	9536 101 109
600 mm	150 mm	3 mm	1195 900 043





## The EUROPART anti-slip mats are certified by the Fraunhofer Institute:

### Prüfzeugnis über Reibbeiwerte

Geprüft nach VDI Richtlinie 2700, Blatt 14

PZ Nr. 05 / 2012

Herstellerüberlassung des Zertifikates für die:

Europart Holding GmbH



#### 1. Beschreibung der Reibpartner:

- 1.1 Auflagefläche:  
Lkw-Ladefläche mit Siebdruckboden  
Zustand: mittelstark gebraucht

#### 1.2 Ladegut:

- 1.2.1 Holz-Palette im Euro-Format  
Abmessungen: 1200 x 800 mm (L x B)  
1.2.2 Masse der Ladeeinheit: 988 kg

#### 2. Rutschhemmendes Material (RhM):

- 2.1 Bezeichnung des RhM: **PKD 720 (Pad)**  
2.2 Abmessung der RhM-Prüfmuster:  
200 x 100 mm (L x B)  
2.3 Dicke des RhM-Prüfmusters: **8,0 mm**

#### 3. Prüfbedingungen:

- 3.1 Umgebungstemperatur: 19 °C  
3.2 Ort und Datum der Prüfung: Alfeld, 04.09.2012

#### 4. Anordnung des rutschhemmenden Materials (RhM) bei der Prüfung:

Die Zuschnitte (Pads) des RhM werden wie in Bild 1 jeweils zu drei (3) Stück unter den beiden äußeren Kufen verlegt. Verlegt werden insgesamt sechs (6) Pads.

#### 5. Berechnungsrelevanter Gleit-Reibbeiwert gemäß VDI-Richtlinie 2700, Blatt 14

$\mu_D = 0,65$  (5 % Sicherheitsabschlag berücksichtigt)



Bild 1: Palette mit Ladung auf 6 Stück RhM Pads PKD 720 – Kufen längs zur Zugrichtung



Bild 2: Zugkraftmessung Holz-Palette auf PKD 720

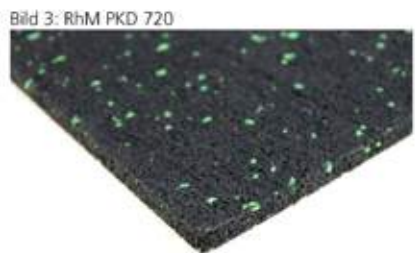


Bild 3: RhM PKD 720

Alle Messergebnisse wurden dokumentiert und können auf Anfrage nachgewiesen werden.  
Die Ergebnisse gelten ausschließlich für die ausgewiesene Reibpaarung, bestehend aus:  
Ladung (hier: Palette) und RhM und Ladefläche.

**Hinweis:** Der vorgenannte Reibbeiwert gilt ausschließlich für Neumaterial. Durch wiederholten Einsatz des RhM kann sich der Reibwert verringern.

Fraunhofer Institut IML  
Prüfinstitut

*in. J. Hanel*

Prüfer

Dortmund, 05. Dez. 2012  
Ort, Datum der Ausstellung

# Blocking elements



## Intermediate panel lock to secure loads

for insertion and clamping on the gate or on the tarpaulin frame

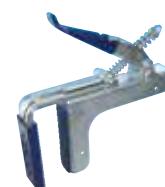
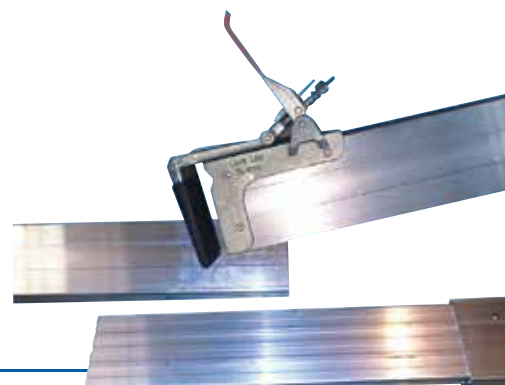
Version	completely assembled
Locking force	400 daN
Length range	2400-2700 mm
Surface	blue anodized

**Scope of supply**  
with extendable aluminium plate and 2 locks

Order no.
9690 000 034

### Accessories

Description	Order no.
End piece	9081 021 442

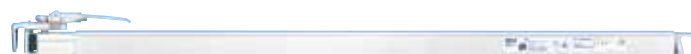


## Intermediate panel lock ClipBoard

Locking force	1000 daN
Material	aluminium

**Application range**  
for board panel 18-35 mm

Type	Length range	Order no.
PAT1000-1	2400-2520 mm	9695 110 201
PAT1000-2	2290-2520 mm	9695 110 221



## Intermediate panel lock ClipBoard

patented joint for secure anchoring to the gate side/roof arch bar, lock on one side for easy positioning and locking

Locking force	625 daN
Length range	2460-2520 mm
Material	aluminium

**Application range**  
for gate side 25 mm

Order no.
9695 111 301



## Clamping bar toothed rack

comprising spring system, rubber bases and aluminium pipe

Locking force	300 daN
Length range	2350-2720 mm
Pipe Ø	42 mm

Order no.
9690 000 090

### Accessories

Description	Order no.
Telescopic tube	9690 000 089
Housing	9690 002 208
Rubber base	9690 000 228



Clamping bars are usually mounted across the load space or diagonally. Only clamping bars supplied by tested brand manufacturers ensure the necessary safety. **Clamping bars must not be replaced by „home-made“ bars!**

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GOOD TO KNOW



## Clamping bar

### SAM

Rubber feet both sides

Locking force 140 daN

Length range	Order no.
2350-2745 mm	9690 071 084
2650-3045 mm	9695 103 742



## Telescopic tube

### Locking barrier

Length range 2100-2470 mm  
Pipe Ø 42 mm  
Load capacity, max. 140 daN  
Material aluminium

Order no.

9690 000 089



## Load beam

### for combination stay/lashing rail

steel end pieces on both sides

Load capacity 1000 daN  
Length range 2303-2582 mm  
Pipe Ø 83 x 66 mm  
Material aluminium

Order no.

9690 000 215

#### Accessories

Description	Order no.
End piece	9690 183 901



## Clamping bar

### SAM Profi

Used as flexible storage compartment separation. Simple securing of loads using vertically or horizontally clamped bars, without changes to the bodywork. For connections that are as secure as they are flexible: with large adjustment area, high load-bearing capacity up to 140 daN and built-in comfort through the integrated, pre-tensioned spring package. In various designs for all possible case sizes. Rubber feet both sides.

Locking force 140 daN  
Pipe Ø 52 mm  
Material Aluminium

As options, the bars are also available in one-sided or two-sided versions with 19 or 24 mm bolts

Length range	Order no.
2100-2600 mm	9695 105 101
2500-3100 mm	9691 051 016



## Ratch

### Airline-Beam 1855

suitable for horizontal and vertical use, automatic airline pins on both sides each lock into a pair of holes in the airline lashing rails, telescopic tubes exert no spring pressure on the vehicle, can be offset at a slight angle

#### Application range

together with parallel running airline lashing rails in the vehicle, trailer or other means of transport, provides form-fitting load securing

Locking force	Length range	Order no.
100-300 daN	1700-2500 mm <sup>1</sup>	9108 551 700
200-300 daN	1200-1750 mm	9108 551 200

<sup>1</sup> note working height for vertical use

Further lengths available!

Blocking strengths depend on the length used.





## Combination stay/lashing rail

**3009**

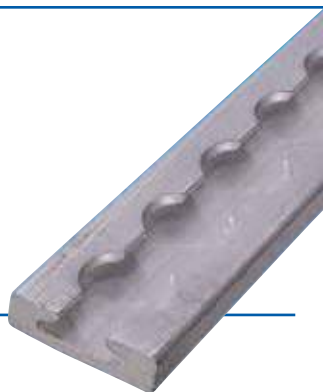
Length	3050 mm	Material	steel
Width	131 mm	Surface	galvanised
Height	12 mm		

### Application range

For medium-weight goods

Order no.

9690 000 203



## Lashing rail

**Airline 5002**

Type	5002	Length	3000 mm
Hole Ø	20 mm	Width	34 mm
Material	aluminium	Height	9,5 mm

### Application range

especially for computer transport, air freight and parcel service vehicles

Order no.

9690 071 226

### Accessories

Description	Order no.
End fitting	9690 005 018



## Rod lashing rail

with PVC protective profile

Length	3000 mm
Bolt thickness	8 mm
Material	aluminium

Height	Order no.
48 mm	1500 003 114
66 mm	9690 071 099



## Fixing rail

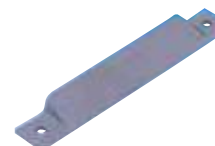
for wall mounting horizontally

Material	steel
Surface	galvanised

### Application range

compatible with 19/24 mm Ø combination spigots and all usual combination fixing rail end fittings

Type	Length	Material thickness	Order no.
3008	3000 mm	2,5 mm	9082 138 021
3009	3048 mm	3 mm	9082 138 015



### Accessories

Description	Order no.
End piece - anchoring rails	8000 000 483



## Round hole lashing rail

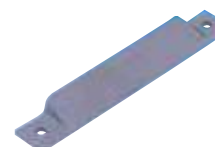
Length	2993 mm
Height	13,5 mm
Thickness	2,5 mm
Hole Ø	25 mm
Material	steel
Surface	galvanised

### Application range

for medium weight goods, telescopic tubes, clothes rails and lashing straps

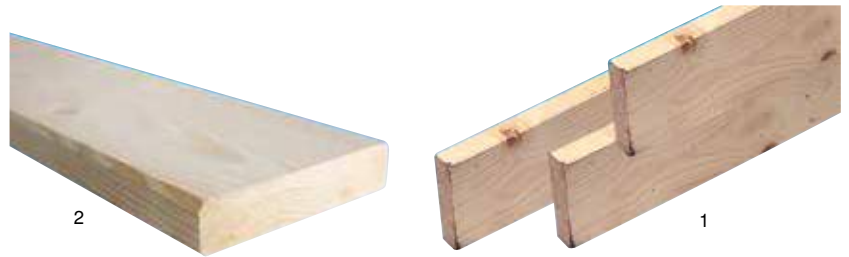
Order no.

9690 002 202



### Accessories

Description	Order no.
End piece - anchoring rails	8000 000 483



## Plug-in board

Material wood

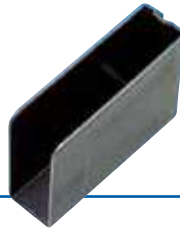
Version	Length	Height	Thickness	Fig.	Order no.
planed	3300 mm	95 mm	24 mm	1	9199 970 040
planed	3600 mm	111 mm	25,5 mm	1	9199 970 000
rounded	3900 mm	111 mm	25,5 mm	2	9199 970 005
rounded	4220 mm	111 mm	25,5 mm		9199 970 096

## Slip-in bag for slat board

Version single, rear closed  
Surface untreated  
Width 80 mm

Height 110 mm  
Thickness 2,5 mm

Interior length	Order no.
25 mm	9081 312 280
28 mm	9081 312 260

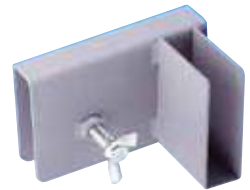


## Clamping bag

**Application range**  
for load securing on platform vehicles

**Scope of supply**  
with wing screw

Installation side	Order no.
left	9080 000 098
right	9080 000 097

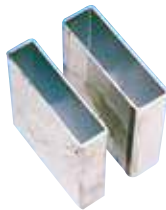


## Plug-in board

Material aluminium  
Length 8000 mm  
Width 25 mm  
Overall height 100 mm  
Thickness 2,2/1,8 mm

sold by the meter

Order no.
9086 210 450



## Storage cushion

2-layer, with inner-tube valve

Storage cushions are used to achieve form-fitted loading.

Height	Width	Order no.
1000 mm	1000 mm	9696 091 206
1200 mm	1000 mm	9696 091 207
1800 mm	1200 mm	9696 091 211
2400 mm	1200 mm	9696 091 202
2400 mm	2000 mm	9696 091 215



### Accessories

Description	Order no.
Pneumatic gun, with inner-tube valve	9696 919 999

# Lashing chains

Lashing chains are primarily used as aids in securing the loads in heavy haulage, as well as in other areas in which heavy goods (e.g. concrete components) are moved.

Lashing chains are extremely tough load securing devices **made of especially hardened steel**, that must be of at least quality grade 8. Because of their high strength and resistance to dirt, oil and other chemicals, they are **predominantly used for securing heavy loads**. They are mainly used in direct lashing. They are only of limited use for lashing down.

In contrast to lashing straps, lashing chains have much **higher tensile forces** (LC or  $F_{perm.}$ ) that can be achieved. Lashing chains exhibit very low stretching behaviour. The stretch factor of high strength round steel chains when the permitted tensile force is reached is about 1 %.

All lashing chains that were manufactured after July 2001 (see identification tag) must conform to the European standard DIN EN 12195-3.

According to EN 120095-3, lashing chains must undergo a visual inspection by an expert once per year and every 3 years a materials test must be carried out by the manufacturer.



## pewag

### Lashing chain

in accordance with VDI 2701, DIN EN 12195-3, with 2 quick-link hooks

Quality grade 8

#### Application range

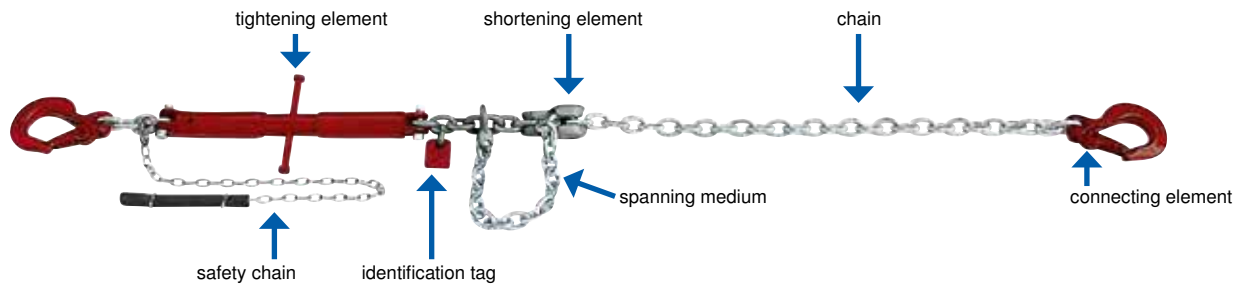
particularly suitable for heavy duty

Version	Tensile strength	Link thickness	Length	Order no.
1-piece	4000 daN	8 mm	3500 mm	9698 121 953
1-piece	6300 daN	10 mm	3500 mm	9691 012 195
1-piece	6300 daN	10 mm	6000 mm	9692 985 101
1-piece	10000 daN	13 mm	3500 mm	9691 312 195
2-piece	4000 daN	8 mm	3500 mm	3002 414 932
2-piece	6300 daN	10 mm	3500 mm	9690 531 001
2-piece	6300 daN	10 mm	4500 mm	3002 431 916
2-piece	6300 daN	10 mm	5000 mm	3002 420 410

We will gladly also supply lashing chains in quality grades 10 and 12. Please contact us!



## Components of a lashing chain conforming to DIN EN 12195-3



**pewag**

### Ratchet load tensioner

**L-140**

Standard DIN-EN 12195-3



Tensile strength	Chain strength	Version	Order no.
4000 daN	8 mm	with unscrewing protection and 2 parallel hooks with safeguard	9690 801 401
6300 daN	10-8 mm	with screwing-out prevention device and 2 parallel hooks with safety device	9690 801 432
10000 daN	13-8 mm	with unscrewing protection and 2 parallel hooks with safeguard	9690 801 403
10000 daN	13-8 mm	2 eyes, no hooks	9690 811 402

**pewag**

### Goniometer

#### Lash Mate, to secure loads

Width x height x depth 200 x 120 x 16 mm

Order no.

9696 085 970

## Replacement state of lashing chains

Lashing chains undergo mechanical wear and must be substituted when they reach the replacement state.

### When does a lashing chain count as ready for replacement?

- visible deformation or cracks at the chain links
- increase in the clear distance between the chain links by more than 5 %
- curved or twisted chains
- at the tensioning elements: fissures, notches, gross distortions and corrosion
- at connecting elements: cracks, gross distortions, broadening of the hook opening by more than 5%, heavy corrosion



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# Lashing points

The usability of lashing points must be ensured and must not be affected by dirt or damage! Here too, according to EN 120095 they must undergo a **visual inspection** by an expert once per year and every 3 years a materials test must be carried out by the manufacturer.

**pewag**



## Lashing ring

with weld-on lug and built-in spring, quality grade 8, with BG approval

The regulations according to DIN EN 14341 and EN 287-1 apply to welding work!

Load capacity	Order no.
3,15 t	6966 092 460
5,3 t	6966 064 470

## Lashing eye for roll-on/roll-off ships

without weld-on lug

Load capacity, max.	10 t
Standard	EN 29367-2
Width	129 mm
Height	132 mm
Surface	galvanised



Order no.
9081 317 110

### Accessories

Description	Order no.
Weld-on lug	9081 317 120



## Lash tray

Breaking strength	300 daN
Length	103 mm
Overall width	70 mm
Interior width	13 mm
Material thickness	6 mm

Order no.
4434 000 765



## Lash tray with ring

Load capacity 2500 daN

Length x width x depth	Order no.
90 x 95 x 30 mm	9081 315 600
72 x 116 x 24 mm	9082 060 045

## Lashing ring for floor frame profile

Load capacity	2500 daN
Width	66 mm
Height	105 mm
Surface	primed

Order no.
9082 060 007



# Tarpaulins/ fastening chains



## Canvas tarpaulin

Version with eyes  
Thickness 1 mm  
Colour green

Length	Width	Order no.
3000 mm	2000 mm	3000 227 100
4500 mm	2500 mm	9690 146 800
4000 mm	3000 mm	3000 227 101
5000 mm	3500 mm	9690 130 505
5000 mm	4000 mm	3000 227 103
7000 mm	3500 mm	9690 130 511
8000 mm	3500 mm	9690 130 512
8000 mm	6000 mm	3000 227 104



## Lifting chain

Quality grade 10



Please observe the safety regulations also during loading.

Application example




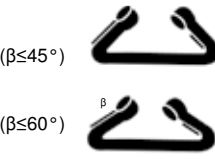



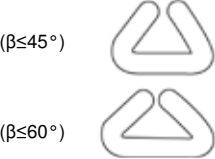
Version	Useful length	Chain strength	Technical data	Width x height x depth	Order no.
1 leg	1 m	8 mm	load capacity 90°, 2500 kg	300 x 200 x 100 mm	9696 017 089
2 legs	1 m	8 mm	load capacity 0° ≤ 45°, 3550 kg load capacity >45° ≤ 60°, 2500 kg	300 x 200 x 100 mm	9696 017 128
2 legs	1 m	10 mm	load capacity 0° ≤ 45°, 5600 kg load capacity >45° ≤ 60°, 4000 kg	300 x 200 x 100 mm	9696 017 014
2 legs	3 m	8 mm	load capacity 0° ≤ 45°, 3550 kg load capacity >45° ≤ 60°, 2500 kg	300 x 200 x 100 mm	9696 030 257
2 legs	3 m	10 mm	load capacity 0° ≤ 45°, 5600 kg load capacity >45° ≤ 60°, 4000 kg	300 x 200 x 200 mm	9696 027 755
4 legs	3 m	10 mm	load capacity 0° ≤ 45°, 8000 kg load capacity >45° ≤ 60°, 6000 kg	400 x 200 x 200 mm	9696 027 834



# Sling bands/ round slings

## Get your load on/off your vehicle safely.

Sling bands and round slings are lifting means according to BGR 500 (previously UVV VBG 9a) and meet all the requirements of DIN EN 1492-1 and 2 as well as A1:2008. In the sense of the standards named, they are flat-woven sling bands or round slings made of synthetic fibres for the purposes of general use, **in particular for the lifting and transporting of loads**. Their use is only permitted by persons assigned and trained by the contractor. The operating instructions must be carefully read before initial operation and must be taken into account during use of the product.

direct	strung	strapped on	
LA=1	LA=0,8	LA=2 ( $\beta \leq 7^\circ$ )	LA=1,4 ( $\beta \leq 45^\circ$ ) LA=1 ( $\beta \leq 60^\circ$ )
			
			

### Use of sling bands and round slings together in association with chemicals:

The materials from which textile products are manufactured (PES, PA, PP) differ both physically (e.g. grip, stability, abrasion behaviour) as well as in their differing resistance towards the effects of chemicals. Polyester is rather resistant towards many acids. Polyamide behaves with more resistance towards many alkalis. Polypropylene demonstrates a high resistance to many acids as well as to many alkalis.

### Attention is especially drawn to the following regulations and technical rules that also apply:

- DIN EN 1492-1 Sling bands made of synthetic materials
- DIN EN 1492-2 Round slings made of synthetic materials
- BGR 500 The management of load suspension devices in hoisting gear operation
- BGI 556 and 873

First use: Before a sling band is put into operation for the first time, a check must be made to establish whether its identification and dimensions are correct. Never use a product that is damaged or whose identification is no longer present.

Identification of sling bands/round slings: In all the products offered here, a label is sewn in as specified according to DIN EN 1492-1 and 2.

The information given on the label is:

- WLL = Working Load Limit, load capacity in the direct type of fastening, figure in metric tonnes
- material:
  - PES = Polyester, blue label
  - PA = Polyamide, green label
  - PP = Polypropylene, brown label
- working length in meters
- year of manufacture
- manufacturer identification DD
- traceability code
- GS mark and testing station
- CE conformity mark
- information on the applicable standards
- load capacity for the useable types of fastening

**Not every fastening type shown is suitable for fastening every load!**

$\beta$  = inclination angle (angle between vertical and the sling band)

**LA** = load fastening factor (relationship to the load capacity in the direct type of fastening, for example: load capacity in the direct type of fastening 10 t (LA=1), load capacity in the strung type of fastening 8 t (LA=0.8))



## Lifting belt

### DIN-EN 1492-1

two-layer sewn polyester band, dimensionally stabilised and impregnated, with 7X safety, colour-coding of the lifting safety, with 2 stitched, half-strengthened loops, better handling thanks to longer and tapered loops



Only suitable for lifting, not for lashing down!

Version	Colour	Band width	Length	Loop length	Order no.
Lifting capacity, stretched draw 2000 kg, in U-shape 4000 kg	green	60 mm	2 m	300 mm	9534 878 324
Lifting capacity, stretched draw 2000 kg, in U-shape 4000 kg	green	60 mm	3 m	300 mm	9534 878 328
Lifting capacity, stretched draw 2000 kg, in U-shape 4000 kg	green	60 mm	4 m	300 mm	9534 878 332
Lifting capacity, stretched draw 2000 kg, in U-shape 4000 kg	green	60 mm	5 m	300 mm	9534 878 336
Lifting capacity, stretched draw 2000 kg, in U-shape 4000 kg	green	60 mm	6 m	300 mm	9534 878 340
Lifting capacity, stretched draw 3,000 kg, in U-shape 6,000 kg	yellow	90 mm	4 m	350 mm	9534 878 346
Lifting capacity, straight draw 3000 kg, in U-shape 6000 kg	yellow	90 mm	5 m	350 mm	9534 878 350
Lifting capacity, straight draw 3000 kg, in U-shape 6000 kg	yellow	90 mm	6 m	350 mm	9539 447 082

## Round loop

made of continuous polyester fibre, with 7X safety, safe verifying facility through colour-coding of the lifting capacity, single casing

Please observe the safety regulations also during loading.

Version	Colour	Band width	Useful length	Scope	Order no.
Lifting capacity, stretched draw 1000 kg, in U-shape 2000 kg	violet	44 mm	1 m	2 m	9534 878 200
load capacity, straight draw 1000 kg, in U-shape 2000 kg	violet	44 mm	1,5 m	3 m	9534 878 204
Lifting capacity, stretched draw 2000 kg, in U-shape 4000 kg	green	44 mm	1 m	2 m	9534 878 216
Lifting capacity, stretched draw 2000 kg, in U-shape 4000 kg	green	44 mm	1,5 m	3 m	9534 878 220
Lifting capacity, stretched draw 2000 kg, in U-shape 4000 kg	green	44 mm	2 m	4 m	9534 878 224
Lifting capacity, stretched draw 2000 kg, in U-shape 4000 kg	green	44 mm	3 m	6 m	9534 878 232
Lifting capacity, stretched draw 3,000 kg, in U-shape 6,000 kg	yellow	55 mm	1,5 m	3 m	9534 878 240
Lifting capacity, stretched draw 3,000 kg, in U-shape 6,000 kg	yellow	55 mm	2 m	4 m	9534 878 244
Lifting capacity, stretched draw 3,000 kg, in U-shape 6,000 kg	yellow	55 mm	3 m	6 m	9534 878 252
load capacity, straight draw 5000 kg, in U-shape 10000 kg	red	44 mm	8 m	4 m	9690 000 037



## Replacement state of sling bands and round slings

### Sling bands and round slings must not be used when there is:

- damage to the selvages (edges of the band) or to the fabric and a large number of broken threads: for instance, more than 10% of the total number of threads in the most heavily damaged cross-section or the band surface (putting down sharp-edged loads), if large areas of the warp (lengthwise) threads are cut through
- damage to the supporting seams or the jacket or its closing stitches caused by squashing, cutting or heat
- damage/visibility of the supporting groups of threads
- deformation/scorching through the effects of heat (friction, radiation)
- damage due to the effect of aggressive substances
- deformations (pronounced widening or thinning of the strap), fissures, breaks or other damage to the components of the fittings

- appearance of a large number of minor damage areas to the edges in a short period of time
- serious reduction in the strength of multi-loaded bands through knots
- missing labels or unreadable identification

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# Load securing for the van



## Ratchet strap

Version with profile hook and push ratchet  
Width 35 mm  
Length 6000 mm  
Fixed end 300 mm  
Loose end 5700 mm  
Colour green  
Material polyester (PES)  
Standard EN 12195-2

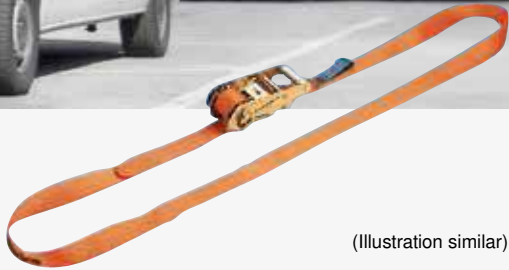
permissible tensile force 1000 daN stretched, 2000 daN in the strapping

Scope of supply  
2-piece



Order no.

9692 000 600



(Illustration similar)

## Ratchet strap

Version with push ratchet  
Width 35 mm  
Length 6000 mm  
Fixed end 6000 mm  
Colour red  
Material Polyester (PES)  
Standard EN 12195-2

permitted tensile force 1000 daN stretched, 2000 daN in the strapping.

Scope of supply  
1-piece

Order no.

9690 000 128



## Ratchet strap

Version with flat hook, safety device and push ratchet  
Width 25 mm  
Fixed end 500 mm  
Colour blue  
Material polyester (PES)  
Standard EN 12195-2

permissible tensile force 500 daN stretched, 1000 daN in the strapping

Scope of supply  
2-piece

Length	Loose end	Order no.
3500 mm	3000 mm	9692 511 340
5000 mm	4500 mm	9692 511 341



## Ratchet strap

Version with clamping lock, light version  
Width 25 mm  
Length 3000 mm  
Fixed end 3000 mm  
Colour yellow  
Material polyester  
Standard EN 12195-2

permitted tensile force 350 daN in the strapping

Scope of supply  
1-piece

Order no.

9534 878 100





## Ratchet strap

Version with push ratchet  
Width 25 mm  
Length 6000 mm  
Loose end 6000 mm

Colour blue  
Material Polyester (PES)  
Standard EN 12195-2

permitted tensile force 1000 daN in strapping

### Scope of supply

1-piece

Order no.

9696 251 000



## Ratchet strap

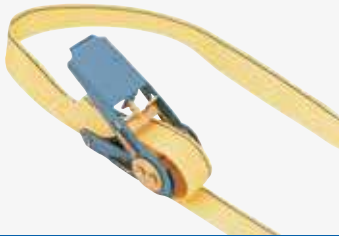
Version with profile hook and mini push ratchet  
Width 25 mm  
Fixed end 500 mm  
Colour red  
Standard EN 12195-2

permitted tensile force 375 daN stretched, 750 daN in strapping.

### Scope of supply

2-piece

Length	Loose end	Order no.
4000 mm	3500 mm	9690 250 735
6000 mm	5500 mm	9690 250 734



## Ratchet strap

(Illustration similar)

Version with mini push ratchet  
Width 25 mm  
Length 4000 mm  
Colour red  
Material polyester (PES)  
Standard EN 12195-2

permitted tensile force 400 daN in the strapping

### Scope of supply

1-piece, without hook

Length	Order no.
4000 mm	9534 878 120
6000 mm	9534 878 121



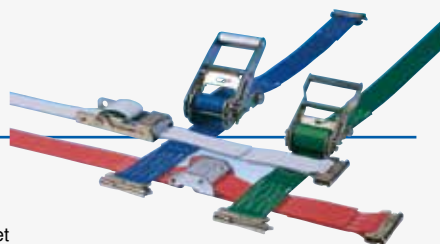
## Ratchet strap

Version with fixing rail fittings and push ratchet  
Width 50 mm  
Colour black  
Material polyester (PES)  
Standard EN 12195-2

### Scope of supply

2-piece

Description	Length	Fixed end	Loose end	Order no.
permitted tensile force 600 daN stretched, 1200 daN in the strapping	3600 mm	1200 mm	2400 mm	9690 079 016
permissible tensile force 750 daN stretched, 1500 daN in strapping	4200 mm	500 mm	3700 mm	9690 000 313



## Ratchet strap

### for type 3009 fixing rail

Version with fixing rail fittings and push ratchet  
Width 50 mm  
Length 3500 mm  
Fixed end 1200 mm  
Loose end 2300 mm  
Colour grey  
Standard EN 12195-2

permissible tensile force 1000 daN stretched, 2000 daN in strapping

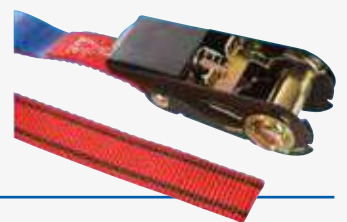
### Scope of supply

2-piece

standard colour grey, can be supplied in other colours as required

Order no.

9690 182 636



## Ratchet strap

Version with mini press ratchet, light design  
Width 25 mm  
Length 4500 mm  
Fixed end 4500 mm  
Colour red  
Material polyester  
Standard EN 12195-2

permitted tensile force 400 daN in the strapping

### Scope of supply

1-piece

Order no.

9690 000 026

## Dolezych

### Ratchet strap for airline fixing rails

Version	with double stud fitting and push ratchet
Width	35 mm
Length	3,5 m
Fixed end	300 mm
Loose end	3200 mm
Colour	green
Standard	EN 12195-2

permissible tensile force 500 daN stretched, 1000 daN in strapping

Order no.
9693 521 120

### Container cover net

a must for environmental protection

Version	knotless
Mesh width	35 mm
Thread Ø	3 mm
Colour	green
Material	polyethylene



Length	Width	Order no.
2200 mm	1500 mm	9690 711 712
2700 mm	1500 mm	9690 711 713
3000 mm	2000 mm	9690 711 723

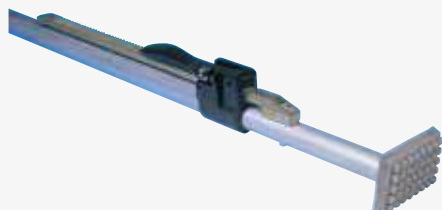
## Dolezych

### Load safety net DoKEP®, for vans, flat beds, trailers

Band width	25 mm
Colour	orange
Material	polyester



Version	Tensile strength	Length	Width	Mesh width	Order no.
main netting	400 daN	2825 mm	1625 mm	175 mm	9696 002 011
main netting	400 daN	2950 mm	1650 mm	300 mm	9696 002 013
main netting	800 daN	2825 mm	1625 mm	175 mm	9696 002 019
main netting	800 daN	2950 mm	1650 mm	300 mm	9696 002 021
extension netting	400 daN	1975 mm	1650 mm	300 mm	9696 002 014
extension netting	400 daN	2025 mm	1625 mm	175 mm	9696 002 012
extension netting	800 daN	1975 mm	1650 mm	300 mm	9696 002 022
extension netting	800 daN	2025 mm	1625 mm	175 mm	9696 002 020



### Clamping bar

Length range	1900-2270 mm
Pipe Ø	42 mm

Order no.
9690 000 096

## Dolezych

### Load safety net DoKEP®, for cars

Version	DoKEP 350 P webbing / cord combination	Colour	orange
Length	1975 mm	Mesh width	300 mm
Width	1000 mm	Material	polyester
Band width	25 mm	Tensile strength	350 daN



Order no.
9616 002 010

Further sizes available on request!

# Hazardous goods transport



## Warning panel

### Waste

retro-reflecting type I

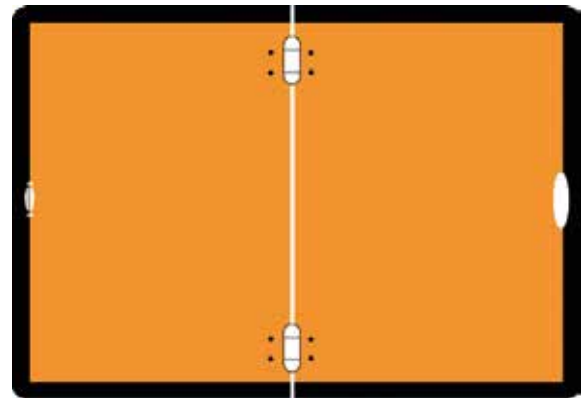
Width 400 mm

Height 300 mm

Version	Material	Order no.
fixed	Magnetic foil	9651 900 020
rigid, with edge protection	sheet steel	9650 205 050
rigid, without edge protection	self-adhesive film	9650 205 051
folding, with fastening elements and edge protection, without mounting components	Sheet steel	9650 205 060
folds horizontally, without edge protection	sheet steel	9650 205 080

### Accessories

Description	Order no.
Fastening set	9900 252 922



## Warning panel

retro-reflecting type 1

Colour orange

in accordance with GGVSEB/ADR

Version	Height	Width	Material	Order no.
rigid, with black edge and edge protection	300 mm	400 mm	self-adhesive film	9650 205 105
fixed, with black edge and edge protection	300 mm	400 mm	Magnetic foil	9651 205 100
rigid, with holder and edge protection	300 mm	400 mm	Sheet steel	9650 205 100
folding, with mounting elements	120 mm	300 mm	Sheet steel	9650 205 130
folding, with edge protection	300 mm	400 mm	Sheet steel	9650 006 001
folds horizontally, with edge protection	300 mm	400 mm	sheet steel	9650 205 112

### Accessories

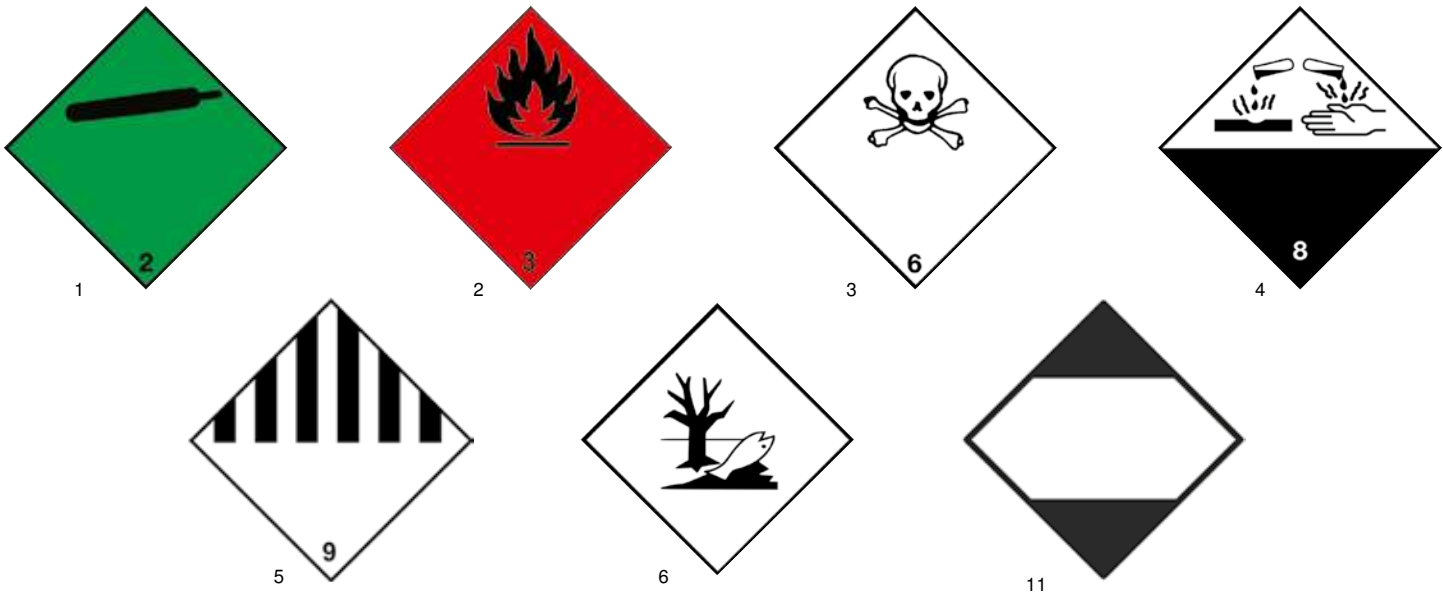
Description	Order no.
Fastening set	9900 252 922



According to the Federal Agency for Freight Transport (BAG), faulty equipment and missing or incorrect identification and labelling are among the most commonly found contraventions with the transportation of hazardous goods.

**EUROPART**  
GOOD TO KNOW

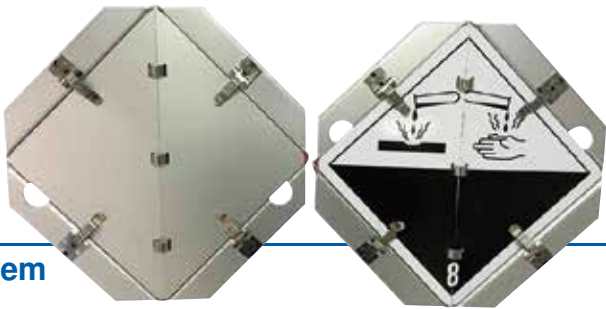




Hazardous goods slip

according to GGVSEB/ADR

Version	Class	Length	Width	Material	Order no.
Non-flammable and poisonous gas	2.2	300 mm	300 mm	self-adhesive film	9650 000 510
Flammable liquids	3	250 mm	250 mm	self-adhesive film	9650 000 340
Toxic	6.1	300 mm	300 mm	self-adhesive film	9650 206 070
Corrosive substances	8	250 mm	250 mm	plastic	9650 000 450
Corrosive substances	8	300 mm	300 mm	self-adhesive film	9650 206 090
Miscellaneous dangerous substances and items	9	300 mm	300 mm	self-adhesive film	9650 206 180
Environmentally hazardous substances	10	250 mm	250 mm	self-adhesive film	1269 000 409
Environmentally hazardous substances	10	300 mm	300 mm	Self-adhesive film	9590 000 509
Environmentally hazardous substances	10	300 mm	300 mm	plastic	9650 003 509
LQ - Limited Quantity	11	250 mm	250 mm	plastic	9650 000 348
LQ - Limited Quantity	11	250 mm	250 mm	Magnetic foil	9650 000 349



Exchange system  
for hazard labels

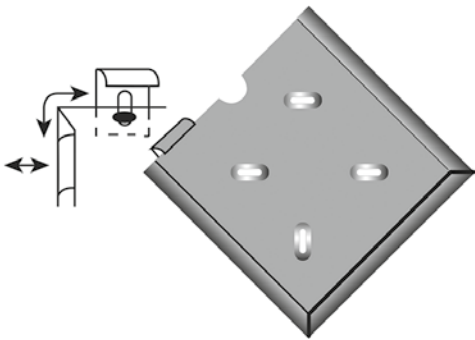
Length 250 mm  
Width 250 mm  
Material aluminium

Scope of supply

with 8 hazard labels:

- hazardous goods class 3 - flammable liquid
- hazardous goods class 4.1 - flammable solid
- hazardous goods class 5.1 - oxidising substance
- hazardous goods class 6.1 - poisonous substance
- hazardous goods class 8 - caustic substance
- hazardous goods class 9 - various environmentally damaging substances
- label for tankers (hazard to bodies of water/drains)
- label for tankers with heated goods

Order no.
8913 182 800



Clip-on frame

Material Sheet steel

Application range

for hazard labels according to GGVSEB/ADR

Width	Order no.
300 mm	9650 206 520
250 mm	9650 206 524



## Case for hazardous goods

Dimensions 420 x 305 x 155 mm  
Material polypropylene  
Colour black

Type	Scope of supply	Order no.
1	<ul style="list-style-type: none"> <li>- PVC gloves, EN 388 EN 374-3 EN 374-2 CE 0120</li> <li>- protective goggles, tight closing, anti mist</li> <li>- eye rinse, sterile with eye wash funnel, 200 ml</li> </ul>	9194 320 000
2	<ul style="list-style-type: none"> <li>- PVC gloves, EN 388 EN 374-3 EN 374-2 CE 0120</li> <li>- eye rinse, sterile with eye wash funnel, 200 ml</li> <li>- protective goggles, tight closing, anti mist</li> <li>- overall (protection against chemicals), size XXL</li> <li>- PVC boots, size 46</li> </ul>	4530 010 350
3	<ul style="list-style-type: none"> <li>- PVC gloves, EN 388 EN 374-3 EN 374-2 CE 0120</li> <li>- eye rinse, sterile with eye wash funnel, 200 ml</li> <li>- protective goggles, tight closing, anti mist</li> <li>- overall (protection against chemicals), size XXL</li> <li>- PVC boots, size 46</li> <li>- full mask</li> <li>- combination filter (9534 880 698)</li> </ul>	4530 010 360
4	<ul style="list-style-type: none"> <li>- PVC gloves, EN 388 EN 374-3 EN 374-2 CE 0120</li> <li>- eye rinse, sterile with eye wash funnel, 200 ml</li> <li>- protective goggles, tight closing, anti mist</li> <li>- overall (protection against chemicals), size XXL</li> <li>- PVC boots, size 46</li> <li>- full mask</li> <li>- combination filter (9534 880 698)</li> <li>- bandage pack with rescue blanket to DIN 13164</li> </ul>	4530 030 361

## Eye rinsing bottle

handy and ready-to-use bottle filled with sterile water, very easy and quick to use in an emergency, rinsing time approx. 2 minutes, sterile and hygienic, simple and quick to use, high functional safety, maintenance-free, keeps for up to 3 years

Standard DIN/EN 1514-4 (DIN 12930)

### Application range

particularly also for mobile use e.g. in toolbox, first-aid case, vehicles etc.

Contents	Container	Order no.
200 ml	Bottle	9650 208 050
500 ml	Bottle	9657 200 056



## Combination filter for full-face mask

Type A2B2E2K2-Hg-P3  
Standard DIN EN 143

Order no.
9650 208 080

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