

# pewag textile lashing straps and textile lifting slings

Lashing and lifting





# Content

## pewag textile straps and round slings, professional solutions for securing and elevating loads

With our polyester straps, you can deal with the high demands of load securing and hoisting technology in an economical and efficient way.

The pewag textile program comprises of a series of tested products which make the securing of your cargo easier. Our extra service: competent advice and training for dealers and users provided directly by the manufacturer.

### pewag group

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# Welcome to the pewag group

**We are an internationally operating group of companies. Our track record goes back to the year 1479.**

## Mission Statement

**pewag group's Mission Statement expresses the goals of our actions as follows:**

With our joy for innovation, we strive to make all products of the pewag group the best in the respective markets. The high quality of our products and services as well as our employees' passionate dedication are the foundation to our pursuit of outstanding services and complete customer satisfaction.

## Principles of pewag group

### Leading in Quality

The values of our product brands are demonstrated by our first-class quality and innovations and are communicated consistently and coherently.

We anticipate market demands and changes in the environment and adapt our strategies, organizations and actions accordingly to satisfy our customers' needs through providing an optimal price-performance ratio: timely delivery, efficient and obliging service.

### Leading in Responsibility

We commit ourselves to careful treatment of the environment, by reducing the use of energy and raw materials, ensuring the longevity of our products and making them recyclable.

We value an open, honest and team-oriented work-style, which is based on transparent communication honoring ideas, opinions and experience of our employees as valuable inputs for our decision making process.

We strive for stable and fair partnerships with our employees, customers, suppliers and other business partners and take social aspects into consideration when making business decisions.

### Leading in Technology

We secure our technological strength by striving for product quality, constant improvements and innovations of products, as well as manufacturing processes.

We strive to be the best in product technology. This ensures that our customers always have optimal solutions available and that we expand and protect our market position.

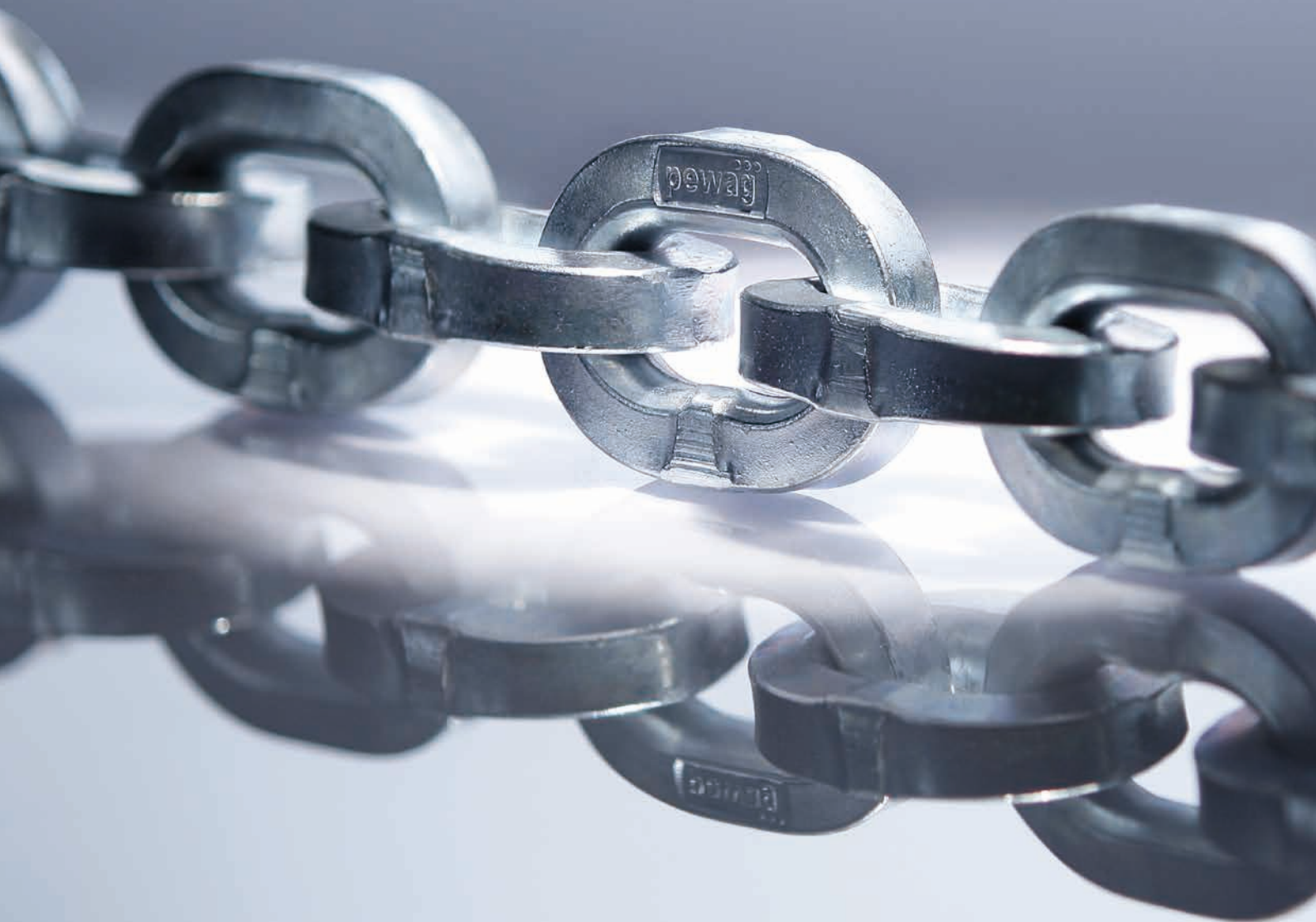
### Leading in Economics

In all our processes we use due diligent business practices and efficiency and strive to improve these continuously.

In the long-term, we will continuously increase our economic performance to raise corporate value, achieve sustained growth and thus secure a successful future of the organization.

We are a modern group of companies which looks back to a tradition and experience of more than 500 years. Since our founding years, a lot has changed, but the values that made our success possible from the beginning remain.

**pewag group –  
Innovation. Quality. Partnership.**



# History of the pewag group

## Advantage through tradition

The history of pewag group goes back to the 15<sup>th</sup> century and therefore makes us one of the oldest chain manufacturer worldwide. With our experience we are ready for the future.

### Timetable of important events

- 1479** First documented references of a forging plant in Brückl
- 1787** Foundation of a chain forge in Kapfenberg
- 1803** Foundation of a chain forge in Graz
- 1836** Establishment of an iron casting plant in Brückl
- 1912** Production of the first pewag snow chain
- 1923** Merger of plants in Graz and Kapfenberg –  
Creation of the name “pewag”
- 1972** Foundation of a sales company in Germany
- 1975** Foundation of a sales company in the USA
- 1993** Foundation of pewag austria GmbH
- 1994** Foundation of the first subsidiary in Czech Republic
- 1999** Acquisition of the Weissenfels Group
- 2003** Separation from the Weissenfels Group
- 2005** Reorganization into 2 groups:  
Schneeketten Beteiligungs AG Group – Snow Chains  
pewag austria GmbH Group – Technical Chains
- 2009** Acquisition of Chaineries Limousines S.A.S.
- 2012** Foundation of the first manufacturing company  
in the USA
- 2013/** Foundation of various international sales  
**2014** companies



Lithography forging plant Brückl 1855



Anchor chain forge 1878



Chain forgers 1956

# Quality management

## Our main goal is customer satisfaction.

In this instance, quality means that only those products and services are developed, manufactured and delivered which completely and without compromise satisfy the customer.

The pewag group’s quality policy, is underlined by the following basic principle: **“we supply high-end products and services to our customers that conform to the technical standards and requirements”**, can be summarised in the subsequent four points.

### Market-oriented Quality

In order to maintain and to widen the competitive position of the pewag group, the quality of finished goods and services must be consistent with the specifications of the customer and also with their expectations of one of the leading companies. No product should ever pose a danger to people or the environment.

### Economic Quality

As a profit-oriented company, quality is achieved by taking into consideration the material, personnel and financial resources; this means that we establish an appropriate best price/performance ratio for the customer within the acknowledged framework.

### Quality Responsibility

Stringent demands are placed on all employees to ensure high standards of quality. No matter what hierarchical level, all managers are in charge of managing quality. Every employee within the pewag group should be educated, motivated and instructed by the management team. It is important for promoting high quality awareness that the education and training of employees is at the forefront, as each employee is responsible for the quality of his/her own work.

For each of our employees, the statement **“QUALITY STARTS WITH ME”** must be true!

### Process-oriented Quality

The close interaction between sales, product development, production and customer service is regulated within the individual companies by fixed processes and activities, as well as responsibilities with the aim to reach and maintain the defined quality standards.



# Business areas

# Environment – we take responsibility

## Working with pewag products

The pewag group has a substantial and diverse spectrum of products and services.

Our range of products varies from traction chains for tires (snow chains for passenger cars, trucks and special-purpose vehicles, tire protection chains for mining vehicles) over different industrial chains to products for the do-it-yourself sector (light chains, belts, etc.)



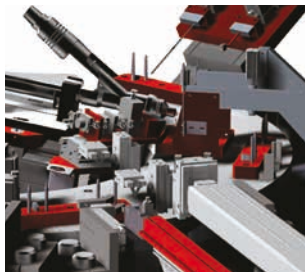
**Segment A**  
Snow and forestry chains



**Segment B**  
Hoist and conveyor chains



**Segment C**  
Do-it-yourself



**Segment D**  
Engineering



**Segment F**  
Lifting and lashing chains and accessories



**Segment G**  
Tire protection chains

## Ecological awareness in all areas



Our company's manufacturing location in Kapfenberg, Austria, has been used for iron and steel production for over 270 years. A second facility located in Brückl, Austria, was first documented in records dating back to 1479.

Based on this long manufacturing tradition, we take serious responsibility for our products, employees and the environment at all our international locations. Hence, one of our major concerns is to improve energy efficiency and, in doing so, to minimise energy consumption over a long period of time with the development of new production technologies. An important goal is to increase energy efficiency and consequently lower energy demand. Consequently, we develop our products to achieve longer product life-cycles and lower weight but simultaneously, increasing their working load capacities and the safety for our customers. We are committed to upholding all relevant energy and environmental standards by setting clearly defined goals and continually improving our performance. To achieve this goal, we use modern manufacturing technologies. An important step is to provide the necessary resources and to include our employees in the process. We are convinced that well-informed and motivated employees can actively participate in environmental conservation.

Wherever we are unable to avoid an environmental impact, we have set ourselves the goal to continually reduce our energy consumption, waste and environmentally harmful emissions. When purchasing new equipment, we strive to find the best and most efficient technical solution possible. It is important for us to promote the purchase of energy efficient products and services.

Our process-oriented management system regulates the documentation concerning all environmental relevant procedures. It also encompasses preventative measures for possible failures, as well as behavioural instructions for regular and/or extraordinary operational procedures. By systematically monitoring and assessing our environmental activities, we are quickly able to resolve deviances and to take corrective action. This process extends throughout the whole organisation to optimise all business processes. We strive to engage in an open dialogue with our customers, neighbours and authorities to inform them of our energy and environmental engagements.

Through specific communication we want to inform our customers about the environmental aspects of our products – specifically inform them about the longevity of our products. Through meaningful communication, we strive to motivate our suppliers and customers to think – in turn – about their environmental footprint and to put into practice similar environmental standards in their businesses.

# Customer proximity

## International presence

In the ambitious five-hundred year history pewag has evolved from a small and modest company to a global organization with several subgroups.

With 12 production and 39 sales and other locations on all five continents, pewag documented its claim as one of the world's leading chain manufacturers.

In addition to the numerous locations pewag as an international company relies on his capillary, strong, and professional partner network. These collaborations provide optimal customer service in currently more than 100 countries around the world.

## Production and sales locations

### Europe

Austria	pewag austria GmbH, Graz pewag austria GmbH, Kapfenberg pewag Schneeketten GmbH & Co KG, Graz pewag Schneeketten GmbH & Co KG, Brückl pewag engineering GmbH, Kapfenberg pewag austria Vertriebsgesellschaft mbH, Graz pewag Ketten GmbH, Klagenfurt pewag International GmbH, Klagenfurt
Germany	pewag Deutschland GmbH, Unna pewag Schneeketten Deutschland GmbH, Unna
France	pewag france SAS, Echirolles / Grenoble Chaineries Limousines SAS, Bellac
Italy	pewag italia srl, Andrian
Croatia	pewag d.o.o, Kroatien, Zagreb
The Netherlands	pewag nederland BV, Hillegom APEX International BV, Hillegom APEX Automotive BV, Hillegom
Poland	pewag polska Sp z.o.o., Buczkowice
Portugal	pewag Portugal – Comercio de Produtos e Eqibamentos Industriais, Lda, Santo Antão do Tojal
Romania	pewag Romania SRL, Sibiu County
Russia	OOO "PEWAG", Moscow
Sweden	pewag sweden AB, Emmaboda
Slovakia	pewag Slovakia sro, Nitra
Czech Republic	pewag Czech sro, Vamberk pewag Snow Chains sro, Vamberk pewag sro, Vamberk pewag Czech sro, Česká Trebová peform Chrudim sro, Chrudim

### Europe

Ukraine	TOV pewag Ukraine GmbH, Lviv
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### North America

USA	pewag Inc, Bolingbrook, Illinois pewag Inc, Rocklin, California pewag Traction Chain Inc, Pueblo, Colorado
Mexico	pewag Mexico SA de CV, Mexico

### South America

Brazil	pewag Brasil Comércio de Correntes Ltda., São Paulo
Colombia	pewag Columbia S.A.S, Medellin

### Africa

South Africa	pewag chain south africa (pty) ltd., Rivonia
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### Australia

Australia	pewag australia Pty Limited, Barrack Heights
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### Asia

India	pewag India Private Limited, Bangalore
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pewag group presents  
itself on the internet. More ...

[www.pewag-group.com](http://www.pewag-group.com)

[www.pewag.com](http://www.pewag.com)

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Innovation. Quality. Partnership.**



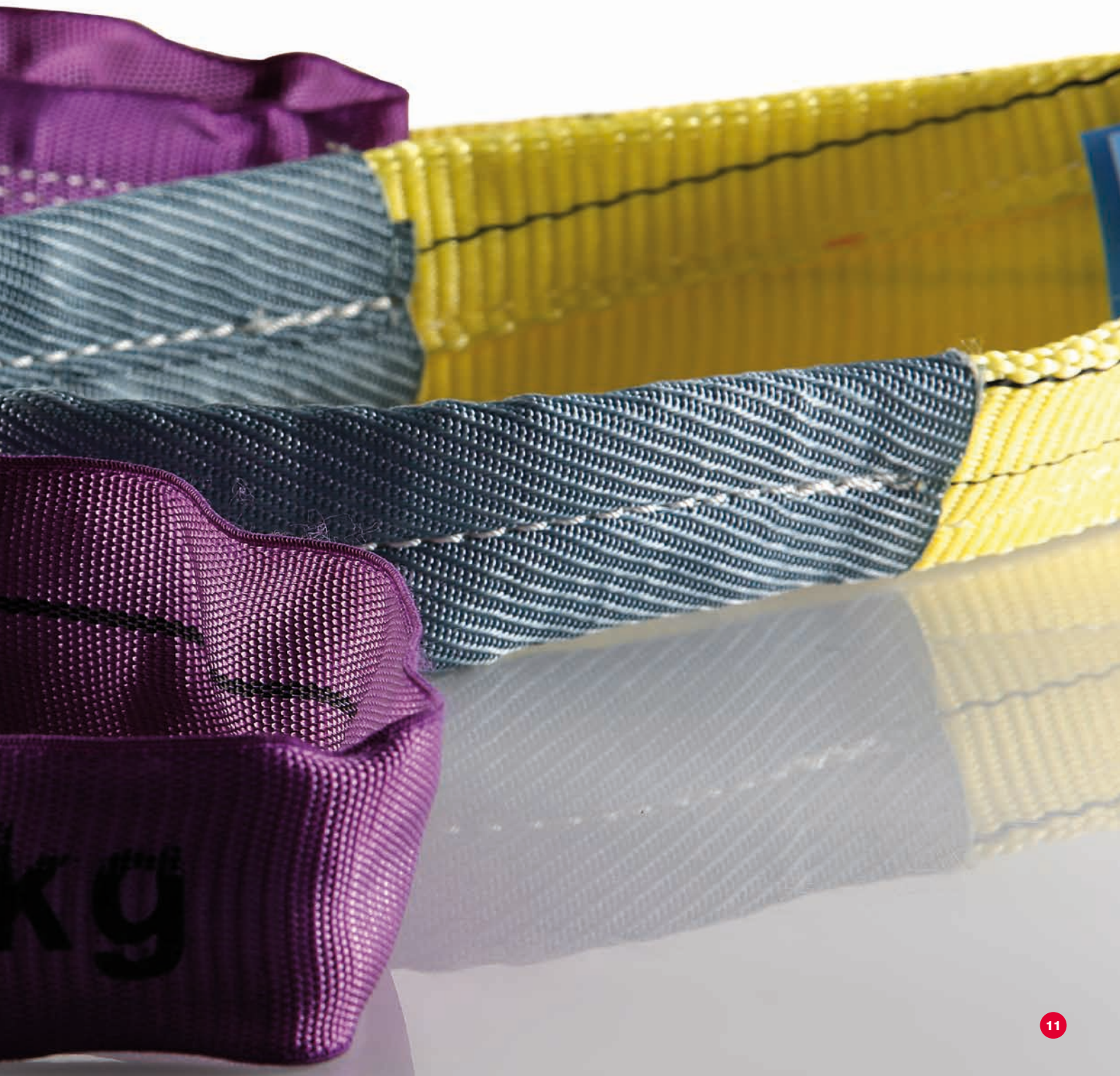
# pewag textile lifting slings

## Product overview

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## pewag textile lifting slings

pewag textile lifting slings for overhead lifting of loads are produced in conformance with the European Standards EN 1492-1 and EN 1492-2, as well as with the Machinery Safety Regulations 2010 (MSV) and the Machinery Directive 2006/42/CE. pewag textile lifting slings are made from high tensile polyester (PES), recognizable by the blue label. PES is suitable to be used and stored with temperatures ranging from -40° to +100 °C and has no expiry date according to the law. Our wide range of round slings and webbing slings can be extended to suit special needs. Technical data and user information can be found on each sling; more detailed information is also provided by the user manual at the end of this catalog.

## pewag textile round slings

pewag textile round slings are made from 100 % polyester (PES) and are ideal for heavyweight applications because of their lightness, flexibility and load friendliness. The test in accordance with the EN 1492-2 and Machinery Safety Regulations 2010 (MSV), the colour coding and working load limit lines ensure the user friendliness and safeness of our roundslings. The wide range of round slings goes up to working load limits of 300 tons. Consecutive numbered labels facilitate the documentation, e.g. for regular inspections.



## pewag textile webbing slings

pewag textile webbing slings are made from 100 % polyester (PES) and produced in 3 different designs. The test in accordance with the EN 1492-1 and Machinery Safety Regulations 2010 (MSV), the colour coding and working load limit strips ensure the user friendliness and safeness of our webbing slings. The wide range of webbing slings comprising webbing slings with reinforced eyes, endless webbing slings and webbing slings with metal end fittings can be complemented with special webbing sling types and accessories to meet customer's requirements.





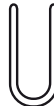
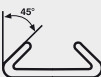
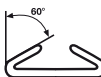
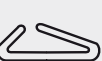
Lifting operation using round slings

# Round slings RS

according to EN 1492-2 and the Machinery Safety Regulations (MSV)



## Working load limit table (kg) according to the type of sling:

Type	Colour coding	Endless sling  100 %	Choke hitch  80 %	 200 %	 140 %	 100 %	Asymmetrie  100 %	Stock length / effective working length [m]	Weight per circumferential length approx. [kg/m]
RS 1	purple	1,000	800	2,000	1,400	1,000	1,000	0.50 / 1 / 1.50 / 2 / 2.50 / 3 / 4 / 5 / 6	0.14
RS 2	green	2,000	1,600	4,000	2,800	2,000	2,000	0.50 / 1 / 1.50 / 2 / 2.50 / 3 / 4 / 5 / 6	0.23
RS 3	yellow	3,000	2,400	6,000	4,200	3,000	3,000	1 / 1.50 / 2 / 2.50 / 3 / 4 / 5 / 6	0.31
RS 4	grey	4,000	3,200	8,000	5,600	4,000	4,000	1 / 1.50 / 2 / 2.50 / 3 / 4 / 5 / 6	0.41
RS 6	brown	6,000	4,800	12,000	8,400	6,000	6,000	1 / 1.50 / 2 / 2.50 / 3 / 4 / 5 / 6	0.60
RS 8	blue	8,000	6,400	16,000	11,200	8,000	8,000	1 / 1.50 / 2 / 2.50 / 3 / 4 / 5 / 6 / 8 / 10	0.75
RS 10	orange	10,000	8,000	20,000	14,000	10,000	10,000	2 / 3 / 4 / 5 / 6	0.95
RS 12	orange	12,000	9,600	24,000	16,800	12,000	12,000	available in all effective working lengths up to 15 m	1.32
RS 15	orange	15,000	12,000	30,000	21,000	15,000	15,000	available in all effective working lengths up to 15 m	1.50
RS 20	orange	20,000	16,000	40,000	28,000	20,000	20,000	available in all effective working lengths up to 15 m	2.00
RS 25	orange	25,000	20,000	50,000	35,000	25,000	25,000	available in all effective working lengths up to 15 m	2.68

Available up to 300 tons

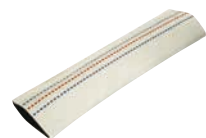
### Order example:

Polyester round sling type RS 1 with an effective working length (L1) of 3,000 mm (circumferential length = 6,000 mm), according to EN 1492-2, working load limit in endless slings 1,000 kg.

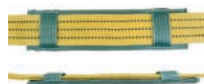
### Order text:

Round sling RS 1 x 3,000

### Accessories:



AS  
Protective sleeve



GS  
Edge wear pad



KSPU  
Edge protection profile sleeve



Edge protection angles made from Polyurethan

Available with **peTAG solution**  
For more information, see p. 27






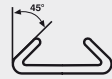
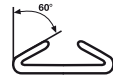

# Round slings RS PRO

acc. to EN 1492-2 and the Machinery Safety Regulations

- With robust protective sleeve
- Significantly longer lifespan thanks to optimised wear and abrasion resistance
- Load capacity is woven into the material



## Working load limit table (kg) according to the type of sling:

Type	Colour coding	Endless sling  100 %	Choke hitch  80 %	 200 %	 140 %	 100 %	Asymmetrie  100 %	Weight per circumferential length approx. [kg/m]
RS PRO 1	purple	1,000	800	2,000	1,400	1,000	1,000	0.16
RS PRO 2	green	2,000	1,600	4,000	2,800	2,000	2,000	0.25
RS PRO 3	yellow	3,000	2,400	6,000	4,200	3,000	3,000	0.24
RS PRO 4	grey	4,000	3,200	8,000	5,600	4,000	4,000	0.45
RS PRO 6	brown	6,000	4,800	12,000	8,400	6,000	6,000	0.66
RS PRO 8	blue	8,000	6,400	16,000	11,200	8,000	8,000	0.88
RS PRO 10	orange	10,000	8,000	20,000	14,000	10,000	10,000	1.20
RS PRO 12	orange	12,000	9,600	24,000	16,800	12,000	12,000	1.40
RS PRO 15	orange	15,000	12,000	30,000	21,000	15,000	15,000	1.74

### Order example:

Polyester round sling type RS PRO 1 with an effective working length (L1) of 3,000 mm (circumferential length = 6,000 mm), according to EN 1492-2, working load limit in endless slings 1,000 kg.

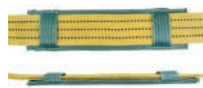
### Order text:

Round sling RS PRO 1 x 3,000

### Accessories:



AS  
Protective sleeve



GS  
Edge wear pad



KSPU  
Edge protection profile sleeve



Edge protection angles made from Polyurethan

## Webbing sling type B2

acc. to the European standard EN 1492-1 and the Machinery Safety Regulations

- With reinforced eyes



Working load limit table (kg) according to the type of sling:

Webbing width [mm]	Colour coding	Diagram			45°	60°
		100 %	80 %	200 %	140 %	100 %
30	purple	1,000	800	2,000	1,400	1,000
60	green	2,000	1,600	4,000	2,800	2,000
90	yellow	3,000	2,400	6,000	4,200	3,000
120	grey	4,000	3,200	8,000	5,600	4,000
150	red	5,000	4,000	10,000	7,000	5,000
180	brown	6,000	4,800	12,000	8,400	6,000
240	blue	8,000	6,400	16,000	11,200	8,000

### Order example:

Webbing sling according to EN1492-1 type B2, two-layer webbing slings with reinforced eyes, webbing width 90 mm, effective working length L1 = 2,000 mm, made from polyester PES, working load limit for straight and direct lifting 3,000 kg

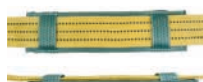
### Order text:

Webbing sling B2 90 x 2,000 / 3,000

### Accessories:



AS  
Protective sleeve



GS  
Edge wear pad



KSPU  
Edge protection profile  
sleeve



Edge protection angles  
made from Polyurethan




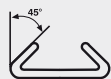
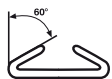
Available with **peTAG solution**  
For more information, see p. 27

## Webbing sling type A2

endless webbing sling, according to EN 1492-1 and the Machinery Safety Regulations (MSV)



Working load limit table (kg) according to the type of sling:

Width	Colour coding				45° 	60° 
[mm]		100 %	80 %	200 %	140 %	100 %
30	purple	1,000	800	2,000	1,400	1,000
60	green	2,000	1,600	4,000	2,800	2,000
90	yellow	3,000	2,400	6,000	4,200	3,000
120	grey	4,000	3,200	8,000	5,600	4,000
150	red	5,000	4,000	10,000	7,000	5,000
180	brown	6,000	4,800	12,000	8,400	6,000
240	blue	8,000	6,400	16,000	11,200	8,000

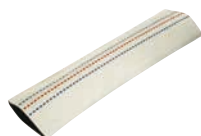
### Order example:

Endless webbing sling according to EN1492-1 type A2, one-layer webbing sling, width 150 mm, effective working length 3,000 (circumferential length L1 = 6,000 mm), made from polyester PES, working load limit in endless slings 5,000 kg.

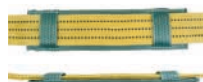
### Order text:

Webbing sling A2 150 x 3,000 / 5,000

### Accessories:



AS  
Protective sleeve



GS  
Edge wear pad



KSPU  
Edge protection profile sleeve



Edge protection angles made from Polyurethan

## Webbing sling type Cr2

according to EN 1492-1 and the Machinery Safety Regulations (MSV)

- with high strength fittings



Working load limit table (kg) according to the type of sling:

Width [mm]	Colour coding				45° 	60° 
		100 %	80 %	200 %	140 %	100 %
30	purple	1,000	800	2,000	1,400	1,000
60	green	2,000	1,600	4,000	2,800	2,000
90	yellow	3,000	2,400	6,000	4,200	3,000
120	grey	4,000	3,200	8,000	5,600	4,000
150	red	5,000	4,000	10,000	7,000	5,000
180	brown	6,000	4,800	12,000	8,400	6,000
240	blue	8,000	6,400	16,000	11,200	8,000

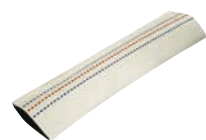
### Order example:

Webbing sling according to EN1492-1 type Cr2, two-layer webbing sling, width 90 mm, effective working length 4,000, made from polyester PES, WLL for straight and direct lifting 3,000 kg with high strength fittings EZD 100 on both sides.

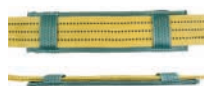
### Order text:

Webbing sling Cr2 90 x 4,000 / 3,000 EZD-EZD

### Accessories:



**AS**  
Protective sleeve



**GS**  
Edge wear pad



**KSPU**  
Edge protection profile sleeve



Edge protection angles made from Polyurethan

Available with **peTAG solution**  
For more information, see p. 27



## Webbing sling type B2 4-layer

- Webbing slings for use with heavy loads
- Double the load capacity of 2-layer webbing slings of the same width



### Working load limit table (kg) according to the type of sling:

Width [mm]	Colour coding				45°	60°
		100 %	80 %	200 %	140 %	100 %
30	green	2,000	1,600	4,000	2,800	2,000
60	grey	4,000	3,200	8,000	5,600	4,000
90	brown	6,000	4,800	12,000	8,400	6,000
120	blue	8,000	6,400	16,000	11,200	8,000
150	orange	10,000	8,000	20,000	14,000	10,000
180	orange	12,000	9,600	24,000	16,800	12,000
240	orange	16,000	12,800	32,000	22,400	16,000
300	orange	20,000	16,000	40,000	28,000	20,000

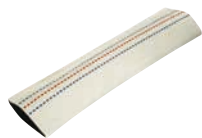
### Order example:

Webbing sling according to EN1492-1 type B2, four-layer webbing slings with reinforced eyes, webbing width 30 mm, effective working length L1 = 4,000 mm, made from polyester PES, working load limit for straight and direct lifting 2,000 kg

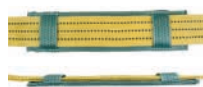
### Order text:

Webbing sling B2 4-layer 30 x 4,000 / 2,000

### Accessories:



**AS**  
Protective sleeve



**GS**  
Edge wear pad



**KSPU**  
Edge protection profile sleeve



Edge protection angles made from Polyurethan



Webbing sling  
4-layer structure



## Webbing slings with solid coating

- Solid coating is firmly moulded onto the webbing sling
- Transparent for improved texture control



### Working load limit table (kg) according to the type of sling:

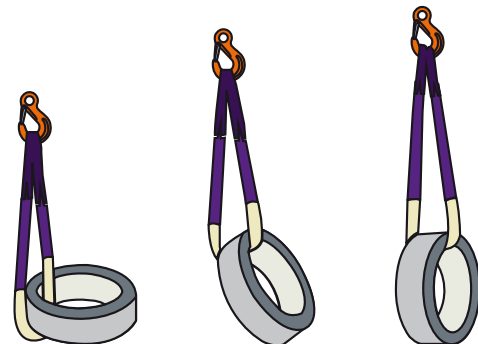
Width	Colour coding	100 %		200 %		45°	60°
30	purple	1,000	800	2,000	1,400	1,000	
60	green	2,000	1,600	4,000	2,800	2,000	
90	yellow	3,000	2,400	6,000	4,200	3,000	
120	grey	4,000	3,200	8,000	5,600	4,000	
150	red	5,000	4,000	10,000	7,000	5,000	
180	brown	6,000	4,800	12,000	8,400	6,000	
240	blue	8,000	6,400	16,000	11,200	8,000	

- Double-sided coating with a min. thickness of 5 mm
- Webbing slings with a solid coating may only be used when the load cannot move in the webbing sling, i.e. when no relative movements occur between the coating and the load

Available with **peTAG solution**  
For more information, see p. 27

## Edge protections profile sleeve

- Excellent protection against wear and tear for textile lifting accessories and lashing straps
- Good resistance even with sharp edges and rough load surfaces
- Standard version may be used on two sides; other special versions are available upon request



Edge protection profile sleeve	Type	for lifting sling Fig. 1 + 2	for round sling Fig. 3 + 4	for round sling Fig. 5 + 6
	KSPU 30	30 mm		1 t
	KSPU 50			2 t
	KSPU 60	60 mm	1 t	
	KSPU 90	90 mm	3 t	4 t
	KSPU 120	120 mm	4 t	6 t
	KSPU 150	150 mm		12 t, 15 t
	KSPU 180	180 mm	8 t	20 t
	KSPU 240	240 mm		
	KSPU 300	300 mm	20 t, 25 t	

The edge protection hose made from polyurethane is designed for the shifting of sharp-edged loads. As the protective hose is free to move on the lifting device, lifting operations with relative movement of the load are also possible. (Fig. 1–6, see p. 21)



## Single-use lifting sling

- For lifting operations as part of the once-only transportation of goods
- a 5-fold safety factor according to DIN 60005 (orange label), a 7-fold safety factor based on EN 1492-1 (blue label)



### Working load limit table (kg) according to the type of sling:

Standard Design	Length [m]	100 %		80 %		200 %		45°	60°
<b>according EN 1492-1 (Safety factor 7:1)</b>									
Type A 48 x 2000 / 500	2.00	500	400	1,000	700	500			
Type A 50 x 500 / 500	0.50	500	400	1,000	700	500			
Type A 50 x 500 / 1000	0.50	1,000	800	2,000	1,400	1,000			
Type A 50 x 800 / 1000	0.80	1,000	800	2,000	1,400	1,000			
Type A 50 x 1000 / 1000	1.00	1,000	800	2,000	1,400	1,000			



### Working load limit table (kg) according to the type of sling:

Standard Design	Length [m]	100 %		80 %		200 %		45°	60°
<b>according DIN 60005 (Safety factor 5:1)</b>									
Type A 48 x 500 / 750	0.50	750	600	1,500	1,050	750			
Type A 48 x 700 / 750	0.70	750	600	1,500	1,050	750			
Type A 50 x 800 / 2500	0.80	2,500	2,000	5,000	3,500	2,500			
Type A 50 x 1000 / 2500	1.00	2,500	2,000	5,000	3,500	2,500			
Type A 50 x 1300 / 2500	1.30	2,500	2,000	5,000	3,500	2,500			


Ideal for one-way transport operations from manufacturer to final consumer. Single-use lifting slings must not be reused and should be destroyed at the end of the transport chain. In this respect, they differ from lifting slings that comply with EN 1492-1 and that may be reused for transport and lifting operations.

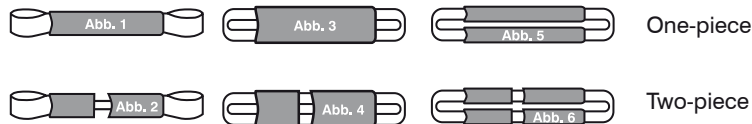
Classic areas of application:

- Prefab-house industry and suppliers
- Timber construction
- Transport of overlong goods, e.g. tubes
- Steel distribution

## AS Gummed protective sleeve

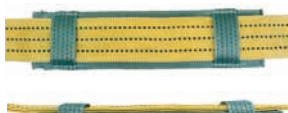
- Gummed, ideal for rough surfaces
- For sharp edges, we recommend to use an edge protector or a edge wear pad GS
- The standard design is not sewed on the sling, so the sleeve can be moved along the sling. On request also available sewed on the material of the sling

AS Protective sleeve	Protective sleeve	Webbing slings B2 / Cr2 mit EZD fig. 1 + 2	Webbing slings A2 fig. 5 + 6	Round slings fig. 3 + 4	Round slings Webbing slings A fig. 5 + 6
	AS 38	30 mm	30 mm	1 t	1 t / 2 t
	AS 52	60 mm	60 mm	2 t / 3 t	3 t / 4 t
	AS 65	-	-	4 t / 6 t	6 t / 8 t
	AS 75	90 mm	90 mm	8 t	-
	AS 102	120 mm	120 mm	10 t / 12 t	10 t / 12 t
	AS 110	150 mm	150 mm	15 t / 20 t	12 t / 20 t
	AS 125	180 mm	180 mm	25 t	25 t



## GS Edge wear pad

- Three-layer, therefore very effective
- made of Polyester PES
- Length 500 mm, special lengths and special widths on upon request

GS Edge wear pad	Type	Webbing slings	Round slings
	GS 50	30 mm	-
	GS 90	60 mm	1 t
	GS 120	90 mm	2 t / 3 t
	GS 150	120 mm	4 t / 6 t
	GS 180	150 mm	8 t
	GS 240	180 mm	10 t

## Edge corners made from polyurethane (PU)

- For webbing slings and round slings
- Available with or without magnet
- Different designs and delivery time upon request



## Protective sleeve for labels

Additional protective sleeve for the load capacity/lashing capacity label is available upon request. If required, the protective sleeve for the label may also be stitched onto the webbing. As lashing straps and webbing slings without labels must be decommissioned, protective sleeves for the label may significantly extend the lifespan of textile lashing and lifting equipment.




## Webbing and round sling assemblies 1- and 2-leg

Standard design according to EN 1492-1

- Premium fittings in grade 10
- Reduced weight thanks to the combination of load-protecting webbing and high-strength fitting parts. Thanks to the use of coupling parts, the system allows for easy assembly by competent personnel

Webbing and round sling assemblies One-leg	Working load limit [kg]	Webbing sling B2 Width [mm]	Round sling RS [t]	Master link Dim.	Connecting link CARW Dim.	Hook HSW Dim.	Length of fitting parts [mm]
	1,000	30	1	MW 10	8	5-6	310
	2,000	60	2	MW 13	8	7-8	360
	3,000	90	3	MW 16	10	10	430
	4,000	120	4	MW 18	10	10	450
	6,000	-	6	MW 22	13	13	550
	8,000	-	8	AW 26	16	16	720
	10,000	-	10	AW 26	22	16	590

Webbing and round sling assemblies Two-leg	Working load limit – Angle of inclination $\beta$ to 45° / to 60° [kg]	Webbing sling B2 Width [mm]	Round sling RS [t]	Master link Dim.	Connecting link CARW Dim.	Hook HSW Dim.	Length of fitting parts [mm]
	1,400 / 1,000	30	1	MW 10	8	5-6	310
	2,800 / 2,000	60	2	MW 16	8	7-8	380
	4,200 / 3,000	90	3	MW 18	10	10	450
	5,600 / 4,000	120	4	MW 22	10	10	450
	8,400 / 6,000	-	6	AW 26	13	13	570
	11,200 / 8,000	-	8	AW 32	16	16	740
	14,000 / 10,000	-	10	AW 32	22	16	610

Available with **peTAG solution**  
For more information, see p. 27

## Webbing and round sling assemblies 3- and 4-leg

Standard design according to EN 1492-1

- Premium fittings in grade 10
- Reduced weight thanks to the combination of load-protecting webbing and high-strength fitting parts. Thanks to the use of coupling parts, the system allows for easy assembly by competent personnel

Webbing and round sling assemblies Three- or four-leg	Working load limit – Angle of inclination $\beta$ to 45° / to 60° [kg]	Webbing sling B2 Width [mm]	Round sling RS [t]	Master link Dim.	Connecting link CARW Dim.	Hook HSW Dim.	Length of fitting parts [mm]
	2,100 / 1,500	30	1	VMW 6	8	5-6	430
	4,200 / 3,000	60	2	VMW 6	8	7-8	450
	6,300 / 4,500	90	3	VW 7-8	10	10	520
	8,400 / 6,000	120	4	VW 10	10	10	560
	12,600 / 9,000	-	6	VW 13	13	13	710
	16,800 / 12,000	-	8	VW 16	16	16	940
	21,000 / 15,000	-	10	VW 16	22	16	810

## Webbing and round sling assemblies in custom designs

Customised, flexible solutions that fully reflect customer requirements.

### Assemblies with different leg lengths:

Ideal to balance differences in level between lifting points.

Typical areas of application:

- Digger loading

### Fully stitched-on assembly

Single legs are directly stitched onto the master link and the end fitting

Benefits:

- Further weight reduction
- Further cost reduction
- Shorter minimal lengths become possible

### Combination of textile and chain

Chain within load capacity for tough applications:

- Weight reduction compared to standard chain sling

Textile within load capacity for sensitive goods

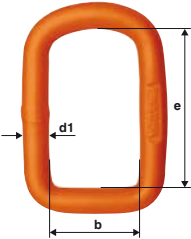
- Protects the surface of the material loaded
- Option of shortening the legs on the chain part

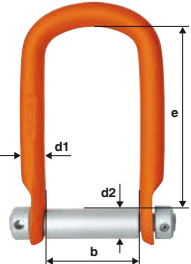


Available with **peTAG solution**  
For more information, see p. 27

## ED and EZD High strength fittings

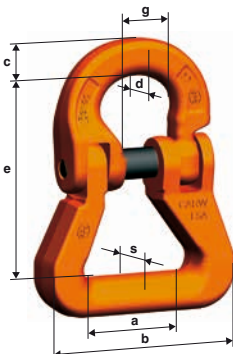
- Made from age-resistant, high-strength material; may be sent back for inspections and reuse to pewag
- Easy assembly and disassembly of the demountable fitting EZD, low wear of end fittings thanks to rotatable steel bolt
- Powder coating for protection against corrosion
- Can also be used in a choke hitch

ED High strength fitting	Type	Suitable for sling width	e [mm]	b [mm]	d <sub>1</sub> [mm]	Working load limit [kg]	Weight [kg/pc.]
	ED 40	30	80	40	13	1,000	0.30
	ED 75	60	125	75	16	2,500	0.70
	ED 105	90	165	105	20	3,000	1.50
	ED 135	120	210	135	23	4,000	2.50
	ED 165	150	245	165	26	5,000	3.80
	ED 195	180	300	195	30	6,000	6.10
	ED 265	240	395	265	36	8,000	11.70

EZD High strength fitting	Type	Suitable for sling width	e [mm]	b [mm]	d <sub>1</sub> [mm]	d <sub>2</sub> [mm]	Working load limit [kg]	Weight [kg/pc.]
	EZD 60	60	110	60	16	20	2,000	0.70
	EZD 100	90	165	100	23	25	3,000	2.00
	EZD 120	120	185	120	23	25	4,000	2.50
	EZD 150	150	235	150	23	35	5,000	3.20

## CARW Round sling connecting link

- For easy assembly of multi-leg webbing slings / round slings
- Thanks to wide surface suitable for round slings / webbing slings, no need of reducing the working load limit
- Supplied with Connex halves, bolt and safety bush

CARW Round sling connecting link	Code	for Webbing sling / Round sling	Working load limit [kg]	a [mm]	e [mm]	c [mm]	d [mm]	b [mm]	s [mm]	g [mm]	Weight [kg/pc.]
	CARW 8	30/60 // 1 / 2	2,500	29	66	12	10	65	18	18	0.40
	CARW 10	90/120 // 3 / 4	4,000	40	81	15	13	82	21	24	0.55
	CARW 13	150 // 6	6,700	50	104	20	17	100	28	28	1.20
	CARW 16	180 // 8	10,000	47	113	21	21	110	40	33	2.00
	CARW 22	240 // 10 / 12 / 15	19,000	109	178	29	27	215	59	48	6.50

## AW Master link

according to EN 1677-4 with higher load capacity

- Master link for 1-leg sling
- Master link for 2-leg sling
- Master link for 3- and 4-leg sling – only with transition link BW as in subassemblies VW
- Can also be used as end link

	Code	Load capacity 0–45° [kg]	Can be used up to single hook acc. to DIN 15401	d [mm]	t [mm]	w [mm]	s [mm]	Weight [kg/pc.]
	AW 10	1,400	Nr. 1,6	10	80	50	10	0.14
	AW 13	2,300	Nr. 2,5	13	110	60	10	0.34
	AW 16	3,500	Nr. 2,5	16	110	60	14	0.58
	AW 18	5,000	Nr. 5	19	135	75	14	0.92
	AW 22	7,600	Nr. 6	23	160	90	17	1.59
	AW 26	10,000	Nr. 8	27	180	100	20	2.46
	AW 32	14,000	Nr. 10	33	200	110	26	4.04
	AW 36	25,100	Nr. 16	36	260	140	29	6.22
	AW 45	30,800	Nr. 25	45	340	180	-	12.82
	AW 50	40,000	Nr. 32	50	350	190	43	16.60
	AW 56	64,000	Nr. 32	56	400	200	-	23.30
	AW 72	85,000	Nr. 50	70	460	250	-	43.11

## MW Enlarged master link

according to EN 1677-4 with higher load capacity

- Similar to master link AW, but due to larger inside dimensions suitable for next sized crane hook or special hook

	Code	Load capacity 0–45° [kg]	Can be used up to single hook acc. to DIN 15401	d [mm]	t [mm]	w [mm]	s [mm]	Weight [kg/pc.]
	MW 10	1,400	Nr. 2,5	11	90	65	10	0.22
	MW 13	2,300	Nr. 4	14	120	70	10	0.44
	MW 16	3,200	Nr. 5	16	140	80	13	0.67
	MW 18	4,200	Nr. 6	19	160	95	14	1.09
	MW 22	6,700	Nr. 10	23	170	105	17	1.74
	MW 26	10,100	Nr. 10	27	190	110	20	2.65
	MW 32	16,000	Nr. 12	33	230	130	26	4.78
	MW 36	21,200	Nr. 20	38	275	150	29	7.48
	MW 56	40,000	Nr. 50	56	350	250	46	21.98

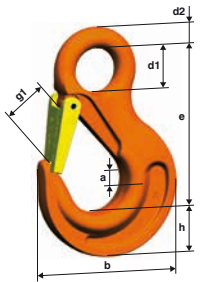
## HSW Eye sling hook

according to EN 1677-2 with higher load capacity

For pewag connex system.

To be connected by means of webbing-/ roundsling connector CARW.

- All hooks with forged safety catch

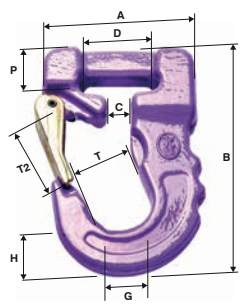
HSW Eye sling hook	Code	Load capacity [kg]	e [mm]	h [mm]	a [mm]	d1 [mm]	d2 [mm]	g1 [mm]	b [mm]	Weight [kg/pc.]
	HSW 5/6	1,400	85	21	17	20	10	19	68	0.30
	HSW 7/8	2,500	106	27	19	25	11	26	88	0.50
	HSW 10	4,000	131	33	26	34	16	31	109	1.10
	HSW 13	6,700	164	44	33	43	19	39	134	2.20
	HSW 16	10,000	183	50	40	50	25	45	155	3.50
	HSW 19/20	16,000	205	55	48	55	27	53	178	5.80
	HSW 22	19,000	225	62	50	60	29	62	196	8.00



## HBH webbing sling hook

- For direct and easy attachment to round slings and webbing slings. Without the need for additional components, this hook allows users to create 1-4-leg assemblies or to attach textile lifting equipment directly to the load
- All hooks include safety catch
- Suitable for the direct installation in round slings or webbing slings, as a connecting link or end hook
- No risk of confusion of load capacities thanks to colour scheme that reflects the colour code for textile lifting equipment



HBH webbing sling hook	Code	Load capacity [kg]	A [mm]	B [mm]	C [mm]	G [mm]	H [mm]	P [mm]	T [mm]	D [mm]	T2 [mm]	Weight [kg/pc.]
	HBH 1	1,000	78	123	12	17	20	16	31	41	26	0.70
	HBH 2	2,000	91	148	19	21	26	17	40	55	31	1.20
	HBH 3	3,000	113	175	21	25	32	25	50	55	37	2.20
	HBH 4	4,000	130	223	40	36	40	36	59	70	43	4.50
	HBH 5	5,000	133	233	40	36	40	36	59	70	43	4.50
	HBH 6	6,000	133	223	40	36	40	36	59	70	43	4.50

# peTAG solution



## peTAG solution Keyfacts



**Intelligent software**  
User-specific adaptation of object data, testing processes and steps. Automates the creation, sending and archiving of test reports. Sophisticated authorisation concept.



**Linked-up partnerships**  
Straightforward exchange and efficient interaction between service providers, merchants and customers. Improved service and data quality. Increased satisfaction and loyalty.



**Save time & money**  
Efficient documentation of work processes, thus simplified daily workflows. Data exchange without media breaks, fault-free data communication.



**Always up to date**  
Access to the latest product data and information, overview of all test data, documentation of test procedures. Traceability of object history.



**Mobile solution**  
Direct, location-independent data access (e.g. load capacity, safety information, latest test reports etc.) Smart servicing of objects via mobile app. Offline availability.



# pewag textile lashing straps

## Product overview

### Content

Information about pewag textile lashing straps	30
Information about load securing	30
Lashing straps	32-49
Lashing winch	50
Accessories	51-52
Anti-slide pad	53
Nets	54
Selecting the right textile lashing equipment	55



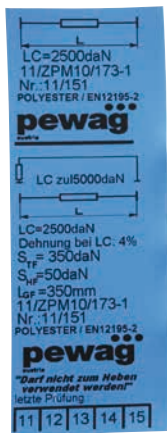


# pewag textile lashing straps

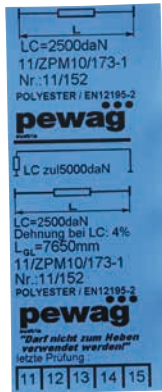
pewag textile lashing strap systems for securing loads are produced according to EN 12195-2. Lashing straps are normally applied as a one-piece lashing strap for strapping or as a two-piece lashing strap composed of a fixed end with tensioning element and end fitting and a loose end with end fitting.

Our extensive range of products ranging from a strap width of 25 to 75 mm and a lashing capacity from 250 to 10,000 daN can be further extended to suit customer's individual needs. Each lashing strap is provided with essential technical data and user information, such like "Do not use for lifting purposes".

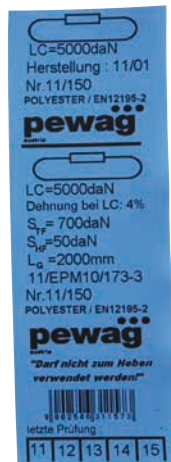
### Lashing strap labels:



Two-piece fixed ends

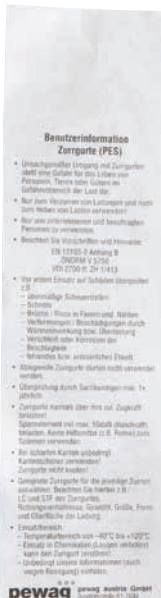


Two-piece loose ends



One-piece

### User information:



# Load securing

In the last years, load securing has become an important issue within transportation in Europe. Since public institutions have tightened up controls, the enforcement of a correct load securing will become a statutory duty in future. pewag has been for years a competent reference person to suit customer requirements. For detailed information, we offer clients a full consultancy service.

### Overview:

Types, length, order text

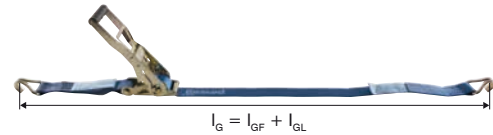
Two-piece lashing strap

One-piece lashing strap

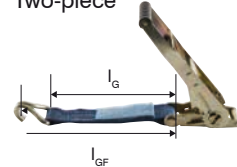


### Lengths according to the corresponding standard for one- and two-piece lashing straps

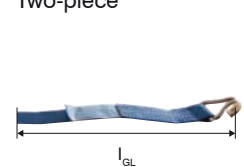
Two-piece lashing strap



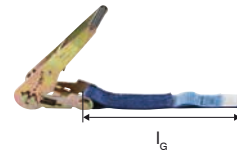
Fixed end to lashing strap  
Two-piece



Loose end to lashing strap  
Two-piece



One piece lashing strap (in strapping)



### Order text two-piece lashing strap: ZG ERGO DZ 50 x 8000 / 2500 Z DHS

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
- Lashing strap system with ratchet indication
  - Width of lashing strap
  - Total length
  - Admissible lashing capacity LC
  - Two-part
  - End fitting DHS

### Order text one-part lashing strap: ZG ERGO DZ 50 x 8000 / 2500 E

- |   |   |   |   |   |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
- Lashing strap system with ratchet indication
  - Width of lashing strap
  - Total length
  - Admissible lashing capacity LC
  - Single-part



Frictional lashing



Long lever ERGO ratchet for higher standard tension force





Double J Hook RH 100 as end fitting



# Lashing Strap ZG 75 KV

with ratchet RA 200

The high admissible lashing capacity results from the double webbing structure and allows securing even the heaviest loads with this lashing strap system. Thanks to its low weight, this lashing strap is a useful alternative to lashing chains.

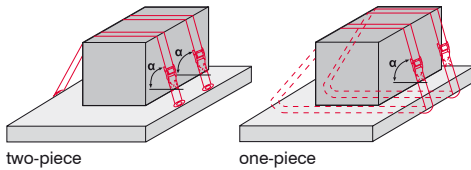
<b>Strap width</b>	<b>75 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	-
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	10,000 daN 
<b>LC – one piece</b> Allowed lashing capacity of the lashing strap in strapping	- 

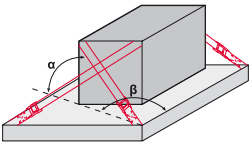


## Road transport applications:

### Frictional lashing

This lashing strap is not designed for frictional lashing according to EN 12195. For special applications, please contact our technical service department.



Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
	$\alpha$ [°]	$\beta$ [°]	0.01	0.1	0.2	0.3	0.4	0.5	0.6
 one-piece	15-35	21-30	-	-	-	35,250	46,900	64,350	99,150
	15-35	31-40	16,000	19,550	24,700	31,950	42,150	57,950	89,500
	15-35	41-50	13,450	16,650	21,350	27,900	36,200	50,000	77,600
	15-35	51-60	1,050	13,300	17,450	22,400	29,300	40,800	63,800
	36-50	21-30	-	-	23,650	31,450	43,150	62,600	101,600
	36-50	31-40	12,650	16,250	21,500	28,850	39,900	58,350	95,200
	36-50	41-50	10,650	13,950	18,850	25,700	35,950	53,050	87,250
	36-50	51-60	-	11,350	15,800	22,000	31,350	46,550	75,700

## Accessories:



**DHS 400**  
Delta link with eye sling hook



**D 400**  
Delta link

### Order example:



ZG 75 KV x 8000 / 10000 Z DHS  
Lashing strap system 75, 2-part, with ratchet RA 200 and 2 DHS units as end fittings, strap width 75 mm  
Double-guided webbing, length  $l_g = 8,000$  mm

Available with **peTAG solution**  
For more information, see p. 27

# Lashing Strap ZG 75

with ratchet RA 200

The high performance system for direct lashing of the heaviest loads covers perfectly the area between common lashing straps and lashing chains, thanks to the 75 mm width and special lengths according to customer's needs.

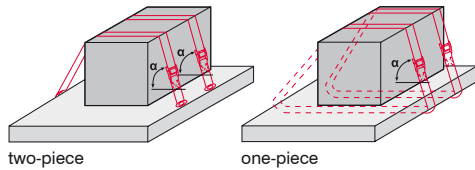
<b>Strap width</b>	<b>75 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	-
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	5,000 daN 
<b>LC – one piece</b> Allowed lashing capacity of the lashing strap in strapping	10,000 daN 

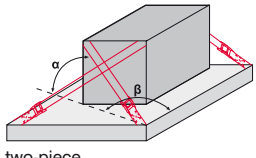


## Road transport applications:

### Frictional lashing

This lashing strap is not designed for frictional lashing according to EN 12195. For special applications, please contact our technical service department.



Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
	$\alpha$ [°]	$\beta$ [°]	0.01	0.1	0.2	0.3	0.4	0.5	0.6
 two-piece	15-35	21-30				17,600	23,450	32,150	49,550
	15-35	31-40	8,000	9,750	12,350	15,950	21,050	28,950	44,750
	15-35	41-50	6,700	8,300	10,650	13,950	18,100	25,000	38,800
	15-35	51-60	5,250	6,650	8,700	11,200	14,650	20,400	31,900
	36-50	21-30			11,800	15,700	21,550	31,300	50,800
	36-50	31-40	6,300	8,100	10,750	14,400	19,950	29,150	47,600
	36-50	41-50	5,300	6,950	9,400	12,850	17,950	26,500	43,600
	36-50	51-60		5,650	7,900	11,000	15,650	23,250	37,850

## Accessories:



**DHS 200**  
Delta link with eye sling hook



**RH 200**  
Double J hook



**D 200**  
Delta link

## Order example:

ZG 75 x 8000 / 5000 Z DHS

Lashing strap system 75 two-piece lashing strap, with ratchet RA 200 and 2 units DHS as end fittings, strap width 75 mm, Length  $l_g = 8,000$  mm



Available with **peTAG solution**  
For more information, see p. 27



# Lashing strap ZG 50 KV

with ratchet RA ERGO-DZ 100

This heavy-load lashing strap is based on the tried-and-tested ZG 50 lashing strap range and offers a high lashing capacity for direct lashing operations thanks to its double-guided webbing. This strap offers a real alternative to smaller lashing chains while protecting the load at the same time.

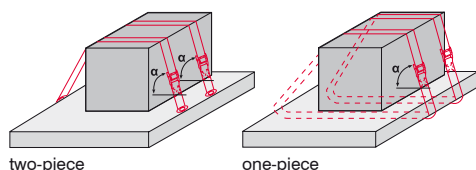
<b>Strap width</b>	<b>50 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	-
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	5,000 daN 
<b>LC – one piece</b> Allowed lashing capacity of the lashing strap in strapping	- 

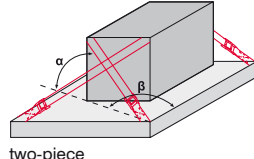


## Road transport applications:

### Frictional lashing

This lashing strap is not designed for frictional lashing according to EN 12195. For special applications, please contact our technical service department.



Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
	$\alpha$ [°]	$\beta$ [°]	0.01	0.1	0.2	0.3	0.4	0.5	0.6
			The load can be secured with 4 lashing straps [daN ~ kg]						
 two-piece	15–35	21–30	-	-	-	17,600	23,450	32,150	49,550
	15–35	31–40	8,000	9,750	12,350	15,950	21,050	28,950	44,750
	15–35	41–50	6,700	8,300	10,650	13,950	18,100	25,000	38,800
	15–35	51–60	5,250	6,650	8,700	11,200	14,650	20,400	31,900
	36–50	21–30	-	-	11,800	15,700	21,550	31,300	50,800
	36–50	31–40	6,300	8,100	10,750	14,400	19,950	29,150	47,600
	36–50	41–50	5,300	6,950	9,400	12,850	17,950	26,500	43,600
	36–50	51–60	-	5,650	7,900	11,000	15,650	23,250	37,850

## Accessories:



**DHS 200-50**  
Delta link with eye sling hook

### Order example:

ZG 50 KV x 8000 / 5000 Z DHS

Lashing strap system 50, two-piece lashing strap, with ratchet RA ERGO-DZ 100 and 2 units DHS as end fittings, strap width 50 mm  
Double-guided webbing, length  $l_G = 8,000$  mm

Available with **peTAG solution**  
For more information, see p. 27

# Lashing strap ZG ERGO DZ 50

with double J hook and ratchet RA ERGO-DZ 100

The user friendliest system for the lashing down of heavy loads now allows to be tensioned under pull thanks to the long lever ERGO-ratchet. The use of the maximal tensioning force (STF) reduces the required number of lashing straps and saves time when loading. Labels are very durable due to their transparent protective covers.



<b>Strap width</b>	<b>50 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	500 daN
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	2,500 daN

### Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle		Dynamic friction factor					
			0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]		The load can be secured with 1 lashing strap [daN ~ kg]					
	90		100	250	450	750	1,250	2,250
	85		100	240	440	740	1,240	2,240
	80		100	240	440	730	1,230	2,210
	70		100	230	420	700	1,170	2,110
	60		90	210	380	640	1,080	1,940
	50		80	190	340	570	950	1,720
	40		60	160	280	480	800	1,440
	30		50	120	220	370	620	1,120

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
			0.01	0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	$\beta$ [°]	The load can be secured with 4 lashing straps [daN ~ kg]						
	15-35	21-30	-	-	-	8,800	11,700	16,050	24,750
	15-35	31-40	4,000	4,850	6,150	7,950	10,500	14,450	22,350
	15-35	41-50	3,350	4,150	5,300	6,950	9,050	12,500	19,400
	15-35	51-60	2,600	3,300	4,350	5,600	7,300	10,200	15,950
	36-50	21-30	-	-	5,900	7,850	10,750	15,650	25,400
	36-50	31-40	3,150	4,050	5,350	7,200	9,950	14,550	23,800
	36-50	41-50	2,650	3,450	4,700	6,400	8,950	13,250	21,800
	36-50	51-60	-	2,800	3,950	5,500	7,800	11,600	18,900

### Accessories:



**RH 100**  
Double J hook

### Order example:

ZG ERGO DZ 50 x 8000 / 2500 Z RH  
Lashing strap system 50, two-piece lashing strap, with ratchet RA ERGO-DZ 100 and 2 units RH as end fittings, strap width 50 mm, length  $l_G = 8,000$  mm

Available with **peTAG solution**  
For more information, see p. 27

# Lashing strap ZG ERGO DZ 50

with delta link, eye sling hook and ratchet RA ERGO-DZ 100

The user friendliest system for the lashing down of heavy loads now allows to be tensioned under pull thanks to the long lever ERGO-ratchet. The use of the maximal tensioning force (STF) reduces the required number of lashing straps and saves time when loading. Labels are very durable due to their transparent protective covers.



<b>Strap width</b>	50 mm
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	500 daN
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	2,500 daN

## Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle	Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	The load can be secured with 1 Lashing strap [daN ~ kg]					
	90	100	250	450	750	1,250	2,250
	85	100	240	440	740	1,240	2,240
	80	100	240	440	730	1,230	2,210
	70	100	230	420	700	1,170	2,110
	60	90	210	380	640	1,080	1,940
	50	80	190	340	570	950	1,720
	40	60	160	280	480	800	1,440
	30	50	120	220	370	620	1,120

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
	$\alpha$ [°]	$\beta$ [°]	0.01	0.1	0.2	0.3	0.4	0.5	0.6
			The load can be secured with 4 Lashing straps [daN ~ kg]						
	15–35	21–30	-	-	-	8,800	11,700	16,050	24,750
	15–35	31–40	4,000	4,850	6,150	7,950	10,500	14,450	22,350
	15–35	41–50	3,350	4,150	5,300	6,950	9,050	12,500	19,400
	15–35	51–60	2,600	3,300	4,350	5,600	7,300	10,200	15,950
	36–50	21–30	-	-	5,900	7,850	10,750	15,650	25,400
	36–50	31–40	3,150	4,050	5,350	7,200	9,950	14,550	23,800
	36–50	41–50	2,650	3,450	4,700	6,400	8,950	13,250	21,800
	36–50	51–60	-	2,800	3,950	5,500	7,800	11,600	18,900

## Accessories:



**DHS 100**  
Delta link with eye sling hook

## Order example:

ZG ERGO DZ 50 x 8000 / 2500 Z DHS  
Lashing strap system 50 two-piece lashing strap, with ratchet RA ERGO-DZ 100 and 2 units DHS as end fittings, strap width 50 mm, length  $l_G = 8,000$  mm



Available with **peTAG solution**  
For more information, see p. 27

# Lashing strap ZG ERGO DZ 50

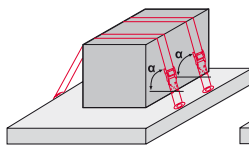
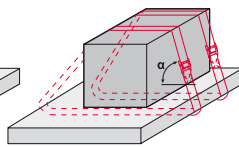
other applications with ratchet RA ERGO-DZ 100

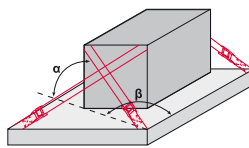
The user friendliest system for the lashing down of heavy loads now allows to be tensioned under pull thanks to the long lever ERGO-ratchet. The use of the maximal tensioning force (STF) reduces the required number of lashing straps and saves time when loading. Labels are very durable due to their transparent protective covers.











<b>Strap width</b>	<b>50 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	500 daN
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	2,500 daN 
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	5,000 daN 

## Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle	Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	The load can be secured with 1 Lashing strap [daN ~ kg]					
	90	100	250	450	750	1,250	2,250
	85	100	240	440	740	1,240	2,240
	80	100	240	440	730	1,230	2,210
	70	100	230	420	700	1,170	2,110
	60	90	210	380	640	1,080	1,940
	50	80	190	340	570	950	1,720
	40	60	160	280	480	800	1,440
	30	50	120	220	370	620	1,120

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
			0.01	0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	$\beta$ [°]	The load can be secured with 4 Lashing straps [daN ~ kg]						
	15–35	21–30	-	-	-	8,800	11,700	16,050	24,750
	15–35	31–40	4,000	4,850	6,150	7,950	11,500	10,500	22,350
	15–35	41–50	3,350	4,150	5,300	6,950	9,050	12,500	19,400
	15–35	51–60	2,600	3,300	4,350	5,600	7,300	10,200	15,950
	36–50	21–30	-	-	5,900	7,850	10,750	15,650	25,400
	36–50	31–40	3,150	4,050	5,350	7,200	9,950	14,550	23,800
	36–50	41–50	2,650	3,450	4,700	6,400	8,950	13,250	21,800
	36–50	51–60	-	2,800	3,950	5,500	7,800	11,600	18,900

## Accessories:

							
<b>DHS 100</b> Delta link with eye sling hook	<b>RH 100</b> Double J hook	<b>RHS 100</b> Double J hook with safety device	<b>D 100</b> Delta link	<b>KHF 100</b> Flat snap hook	<b>FH 100</b> Flat hook	<b>T 100</b> Claw hook	<b>KHG 100</b> Twisted snap hook

## Order example:

ZG ERGO DZ 50 x 8000 / 2500 Z RHS

Lashing strap system 50 two-piece lashing strap, with ratchet RA ERGO-DZ 100 and 2 units RHS as end fittings, strap width 50 mm, length  $l_G = 8,000$  mm



Available with **peTAG solution**  
For more information, see p. 27



# Lashing strap ZG ERGO-XLH 50

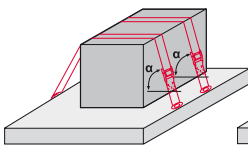
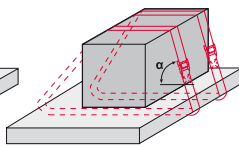
with ratchet RA ERGO-XLH 100

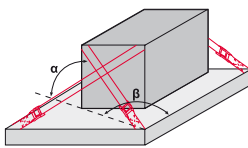
The ZG 50 lashing strap system with an extra-long lever ratchet offers high standard tension forces, thus reducing the number of lashing devices required for frictional lashing.

<b>Strap width</b>	<b>50 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	550 daN
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	2,500 daN 
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	5,000 daN 











## Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle	Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	The load can be secured with 1 Lashing strap [daN ~ kg]					
	90	110	270	490	820	1,370	2,470
	85	110	270	490	820	1,360	2,460
	80	110	270	480	810	1,350	2,430
	70	110	250	460	770	1,290	2,320
	60	100	230	420	710	1,190	2,140
	50	90	210	370	630	1,050	1,890
	40	70	170	310	530	880	1,590
	30	50	130	240	410	680	1,230

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
			0.01	0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	$\beta$ [°]	The load can be secured with 4 Lashing straps [daN ~ kg]						
	15–35	21–30	-	-	-	8,800	11,700	16,050	24,750
	15–35	31–40	4,000	4,850	6,150	7,950	11,500	10,500	22,350
	15–35	41–50	3,350	4,150	5,300	6,950	9,050	12,500	19,400
	15–35	51–60	2,600	3,300	4,350	5,600	7,300	10,200	15,950
	36–50	21–30	-	-	5,900	7,850	10,750	15,650	25,400
	36–50	31–40	3,150	4,050	5,350	7,200	9,950	14,550	23,800
	36–50	41–50	2,650	3,450	4,700	6,400	8,950	13,250	21,800
	36–50	51–60	-	2,800	3,950	5,500	7,800	11,600	18,900

## Accessories:

							
<b>DHS 100</b> Delta link with eye sling hook	<b>RH 100</b> Double J hook	<b>RHS 100</b> Double J hook with safety device	<b>D 100</b> Delta link	<b>KHF 100</b> Flat snap hook	<b>FH 100</b> Flat hook	<b>T 100</b> Claw hook	<b>KHG 100</b> Twisted snap hook

## Order example:



ZG ERGO-XLH 50 x 8000 / 2500 Z DHS  
Lashing strap system 50 two-piece, with ratchet RA ERGO-XLH 100 and 2 units DHS as end fittings, Strap width 50 mm, length  $l_c = 8,000$  mm

Available with **petAG solution**  
For more information, see p. 27

# Lashing strap ZG DOS 50

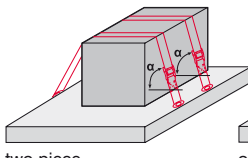
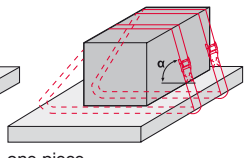
with ratchet RA DOS 100 for controllable loosening

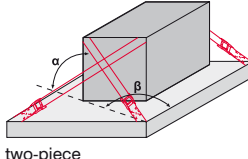
The recommended system for lashing down unstable loads allows for the step-by-step loosening of the pre-tensioning force thanks to the purpose-built DOS ratchet and thus prevents the load from tilting.

<b>Strap width</b>	<b>50 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	350 daN
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	2,500 daN 
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	5,000 daN 












## Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle	Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	The load can be secured with 1 Lashing strap [daN ~ kg]					
 two-piece	90	70	170	310	520	870	1,570
 one-piece	85	70	170	310	520	870	1,560
	80	70	170	310	510	860	3,610
	70	70	160	290	490	820	1,480
	60	60	150	270	450	750	1,360
	50	50	130	240	400	670	1,200
	40	40	110	200	330	560	1,010
	30	30	80	150	260	430	780

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
	$\alpha$ [°]	$\beta$ [°]	0.01	0.1	0.2	0.3	0.4	0.5	0.6
 two-piece	The load can be secured with 4 Lashing straps [daN ~ kg]								
	15–35	21–30	-	-	-	8,800	11,700	16,050	24,750
	15–35	31–40	4,000	4,850	6,150	7,950	11,500	10,500	22,350
	15–35	41–50	3,350	4,150	5,300	6,950	9,050	12,500	19,400
	15–35	51–60	2,600	3,300	4,350	5,600	7,300	10,200	15,950
	36–50	21–30	-	-	5,900	7,850	10,750	15,650	25,400
	36–50	31–40	3,150	4,050	5,350	7,200	9,950	14,550	23,800
	36–50	41–50	2,650	3,450	4,700	6,400	8,950	13,250	21,800
	36–50	51–60	-	2,800	3,950	5,500	7,800	11,600	18,900

## Accessories:

								
<b>DHS 100</b> Delta link with eye sling hook	<b>RH 100</b> Double J hook	<b>RHS 100</b> Double J hook with safety device	<b>D 100</b> Delta link	<b>FPH 100</b> Single J hook with ratchet fitting	<b>KHF 100</b> Flat snap hook	<b>FH 100</b> Flat hook	<b>T 100</b> Claw hook	<b>KHG 100</b> Twisted snap hook

## Order example:



ZG DOS 50 x 10000 / 2500 Z DHS  
Lashing strap system 50, two-piece lashing strap, with ratchet RA DOS 100 and 2 units DHS as end fittings, strap width 50 mm, length  $l_G = 10,000$  mm

Available with **peTAG solution**  
For more information, see p. 27

# Lashing strap ZG 50

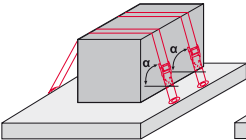
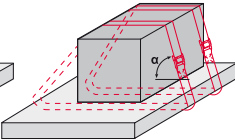
with ratchet RA 100

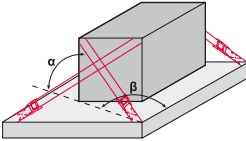
The most versatile system for friction lashing and economical direct lashing of heavy loads offers a high standard tension force (STF) and is the ideal 5-tonnes-strap for professional applications due to the special lengths and the extensive range of accessories.

<b>Strap width</b>	<b>50 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	350 daN
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	2,500 daN 
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	5,000 daN 












## Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle	Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	The load can be secured with 1 Lashing strap [daN ~ kg]					
	90	70	170	310	520	870	1,570
	85	70	170	310	520	870	1,560
	80	70	170	310	510	860	3,610
	70	70	160	290	490	820	1,480
	60	60	150	270	450	750	1,360
	50	50	130	240	400	670	1,200
	40	40	110	200	330	560	1,010
	30	30	80	150	260	430	780

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
	$\alpha$ [°]	$\beta$ [°]	0.01	0.1	0.2	0.3	0.4	0.5	0.6
	15–35	21–30	-	-	-	8,800	11,700	16,050	24,750
	15–35	31–40	4,000	4,850	6,150	7,950	11,500	10,500	22,350
	15–35	41–50	3,350	4,150	5,300	6,950	9,050	12,500	19,400
	15–35	51–60	2,600	3,300	4,350	5,600	7,300	10,200	15,950
	36–50	21–30	-	-	5,900	7,850	10,750	15,650	25,400
	36–50	31–40	3,150	4,050	5,350	7,200	9,950	14,550	23,800
	36–50	41–50	2,650	3,450	4,700	6,400	8,950	13,250	21,800
	36–50	51–60	-	2,800	3,950	5,500	7,800	11,600	18,900

## Accessories:

								
<b>DHS 100</b> Delta link with eye sling hook	<b>RH 100</b> Double J hook	<b>RHS 100</b> Double J hook with safety device	<b>D 100</b> Delta link	<b>FPH 100</b> Single J hook with ratchet fitting	<b>KHF 100</b> Flat snap hook	<b>FH 100</b> Flat hook	<b>T 100</b> Claw hook	<b>KHG 100</b> Twisted snap hook

## Order example:



ZG 50 x 8000 / 2500 Z DHS  
Lashing strap system 50, two-piece lashing strap, with ratchet RA 100 and 2 units DHS as end fittings, strap width 50 mm, length  $l_g = 8,000$  mm

Available with **petAG solution**  
For more information, see p. 27

# Lashing strap ZG 50 VB

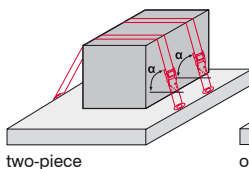
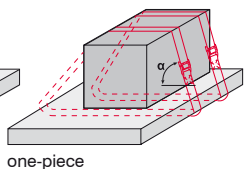
with ratchet RA ERGO-DZ 100

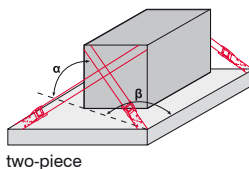
Increased wear resistance thanks to the extra-densely woven webbing. Lashing straps with wear-resistant webbing come with stitched-on label protection sleeve. May be combined with all ratchets and end fittings from the ZG 50 mm range.

<b>Strap width</b>	<b>50 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	500 daN
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	2,500 daN 
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	5,000 daN 











## Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle	Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	The load can be secured with 1 Lashing strap [daN ~ kg]					
 two-piece	90	100	250	450	750	1,250	2,250
 one-piece	85	100	240	440	740	1,240	2,240
	80	100	240	440	730	1,230	2,210
	70	100	230	420	700	1,170	2,110
	60	90	210	380	640	1,080	1,940
	50	80	190	340	570	950	1,720
	40	60	160	280	480	800	1,440
	30	50	120	220	370	620	1,120

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
			0.01	0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	$\beta$ [°]	The load can be secured with 4 Lashing straps [daN ~ kg]						
 two-piece	15–35	21–30	-	-	-	8,800	11,700	16,050	24,750
	15–35	31–40	4,000	4,850	6,150	7,950	11,500	10,500	22,350
	15–35	41–50	3,350	4,150	5,300	6,950	9,050	12,500	19,400
	15–35	51–60	2,600	3,300	4,350	5,600	7,300	10,200	15,950
	36–50	21–30	-	-	5,900	7,850	10,750	15,650	25,400
	36–50	31–40	3,150	4,050	5,350	7,200	9,950	14,550	23,800
	36–50	41–50	2,650	3,450	4,700	6,400	8,950	13,250	21,800
	36–50	51–60	-	2,800	3,950	5,500	7,800	11,600	18,900

## Accessories:

								
<b>DHS 100</b> Delta link with eye sling hook	<b>RH 100</b> Double J hook	<b>RHS 100</b> Double J hook with safety device	<b>D 100</b> Delta link	<b>FPH 100</b> Single J hook with ratchet fitting	<b>KHF 100</b> Flat snap hook	<b>FH 100</b> Flat hook	<b>T 100</b> Claw hook	<b>KHG 100</b> Twisted snap hook

## Order example:

ZG ERGO DZ 50 VB x 8000 / 2500 Z DHS  
Lashing strap system 50, two-piece lashing strap, with ratchet RA ERGO-DZ 100 and 2 units DHS as end fittings, strap width 50 mm, length  $l_G = 8,000$  mm made of wear-resistant webbing.

Available with **peTAG solution**  
For more information, see p. 27

# Lashing strap ZG 50 ... 2000

with ratchet RA 100

The classic system for the lashing down of medium-heavy loads. The standard system is the "4-ton-strap" with a round hook in 8 m and 10 m length, available promptly ex warehouse.

<b>Strap width</b>	<b>50 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	360 daN
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	2,000 daN
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	4,000 daN



## Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle	Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	The load can be secured with 1 Lashing strap [daN ~ kg]					
	90	70	180	320	540	900	1,620
	85	70	170	320	530	890	1,610
	80	70	170	310	530	880	1,590
	70	70	160	300	500	840	1,520
	60	60	150	280	460	770	1,400
	50	50	130	240	410	680	1,240
	40	40	110	200	340	570	1,040
	30	30	90	160	270	450	800

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
	$\alpha$ [°]	$\beta$ [°]	0.01	0.1	0.2	0.3	0.4	0.5	0.6
	15–35	21–30	-	-	-	7,050	9,350	12,850	19,800
	15–35	31–40	3,200	3,900	4,900	6,350	8,400	11,550	17,900
	15–35	41–50	2,650	3,300	4,250	5,550	7,200	10,000	15,500
	15–35	51–60	2,100	2,650	3,450	4,450	5,850	8,150	12,750
	36–50	21–30	-	-	4,700	6,250	8,600	12,500	20,300
	36–50	31–40	2,500	3,250	4,300	5,750	7,950	11,650	19,000
	36–50	41–50	2,100	2,750	3,750	5,100	7,150	10,600	17,450
	36–50	51–60	-	2,250	3,150	4,400	6,250	9,300	15,100

## Accessories:



**RH 100**  
Double J hook

### Order example:

ZG 50 x 8000 / 2000 Z RH  
Lashing strap system 50, two-piece lashing strap, with ratchet RA 100 and 2 units RH as end fittings, strap width 50 mm, length  $l_g = 8,000$  mm



or  
ZG 50 x 10000 / 2000 Z RH  
Lashing strap system 50, two-piece lashing strap, with ratchet RA 100 and 2 units RH as end fittings, strap width 50 mm, length  $l_g = 10,000$  mm



# Lashing strap ZG 35

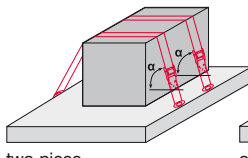
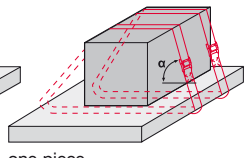
with ratchet RA 40

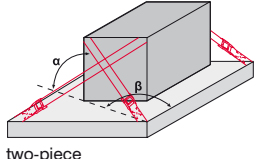
The handy system for lashing down and direct lashing of light loads for commercial purposes and light trailers is characterized by a smaller strap width. Normally used with double J hooks and a length of 6 m.

<b>Strap width</b>	<b>35 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	280 daN
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	1,000 daN 
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	2,000 daN 



## Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle	Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	The load can be secured with 1 Lashing strap [daN ~ kg]					
 two-piece	90	60	140	250	420	700	1,260
 one-piece	85	50	130	250	410	690	1,250
	80	50	130	240	410	680	1,240
	70	50	130	230	390	650	1,180
	60	50	120	210	360	600	1,090
	50	40	100	190	320	530	960
	40	30	80	160	260	440	800
	30	30	70	120	210	350	630

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
			0.01	0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	$\beta$ [°]	The load can be secured with 4 Lashing straps [daN ~ kg]						
 two-piece	15–35	21–30	-	-	-	3,500	4,650	6,400	9,900
	15–35	31–40	1,600	1,950	2,450	3,150	4,200	5,750	8,950
	15–35	41–50	1,300	1,650	2,100	2,750	3,600	5,000	7,750
	15–35	51–60	1,050	1,300	1,700	2,200	2,900	4,050	6,350
	36–50	21–30	-	-	2,350	3,100	4,300	6,250	10,150
	36–50	31–40	1,250	1,600	2,150	2,850	3,950	5,800	9,500
	36–50	41–50	1,050	1,350	1,850	2,550	3,550	5,300	8,700
	36–50	51–60	-	1,100	1,550	2,200	3,100	4,650	7,550

## Accessories:



**DKR 50**  
Delta link with snap hook

**RH 50**  
Double J hook

**D 40**  
Delta link





## Order example:

ZG 35 x 6000 / 1000 Z DKR  
Lashing strap system 35, two-piece lashing strap, with ratchet RA 40 and 2 units DKR as end fittings, strap width 35 mm, length  $l_G = 6,000$  mm

# Lashing strap ZG 48

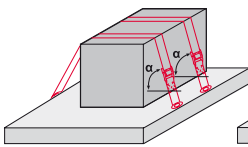
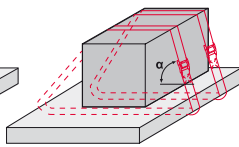
with ratchet RA 20

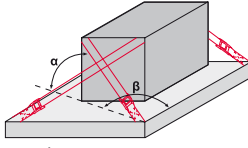
The special system for truck interior lashing of light loads between lashing rails by means of the E truck fitting is thanks to the ratchet also suitable for general applications if equipped with double J hooks.

<b>Strap width</b>	<b>48 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	300 daN
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	800 daN 
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	1,600 daN 



## Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle	Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	The load can be secured with 1 Lashing strap [daN ~ kg]					
	90	60	150	270	450	750	1,350
	85	60	140	260	440	740	1,340
	80	60	140	260	440	730	1,320
	70	60	140	250	420	700	1,260
	60	50	120	230	380	640	1,160
	50	40	110	200	340	570	1,030
	40	40	90	170	280	480	860
	30	30	70	130	220	370	670

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
			0.01	0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	$\beta$ [°]	The load can be secured with 4 Lashing straps [daN ~ kg]						
	15–35	21–30	-	-	-	2,800	3,750	5,150	7,900
	15–35	31–40	1,250	1,550	1,950	2,550	3,350	4,600	7,150
	15–35	41–50	1,050	1,300	1,700	2,200	2,850	4,000	6,200
	15–35	51–60	800	1,050	1,350	1,750	2,300	3,250	5,100
	36–50	21–30	-	-	1,850	2,500	3,450	5,000	8,100
	36–50	31–40	1,000	1,300	1,700	2,300	3,150	4,650	7,600
	36–50	41–50	850	1,100	1,500	2,050	2,850	4,200	6,950
	36–50	51–60	-	900	1,250	1,750	2,500	3,700	6,050

## Accessories:



**SZ 20**  
E truck fitting

**RH 100**  
Double J hook





## Order example:

ZG 48 x 3900 / 800 Z SZ  
Lashing strap system 48, two-piece lashing strap, with ratchet RA 20 and 2 units SZ as end fittings, strap width 48 mm, length  $l_g = 3,900$  mm

# Lashing strap ZG SP 48

with tightener SP 20

The special system with E truck fitting for truck interior lashing of light loads can be fixed between the lashing rails in a very short time thanks to the SP 20 tightener.

<b>Strap width</b>	<b>48 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	-
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	800 daN 
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	- 



**Accessories:**



**SZ 20**  
E truck fitting

**RH 100**  
Double J hook

**Order example:**

ZG SP 48 x 3900 / 800 Z SZ  
Lashing strap system 48, two-piece lashing strap, with tightener SP 20 and 2 units SZ as end fittings, strap width 48 mm, length  $l_g = 3,900$  mm



# Lashing strap ZG KL 35

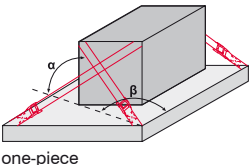
with cam buckle KL 14

The one-piece system with a strong cam buckle is suitable for securing and bundling very light loads in order to form loading units.

<b>Strap width</b>	<b>35 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	-
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	-
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	700 daN



## Road transport applications:

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
	$\alpha$ [°]	$\beta$ [°]	0.01	0.1	0.2	0.3	0.4	0.5	0.6
	The load can be secured with 4 Lashing straps [daN ~ kg]								
	15-35	21-30	-	-	-	2,450	3,250	4,500	6,900
	15-35	31-40	1,100	1,350	1,700	2,200	2,950	4,050	6,250
	15-35	41-50	900	1,150	1,450	1,950	2,500	3,500	5,400
	15-35	51-60	700	900	1,200	1,550	2,050	2,850	4,450
	36-50	21-30	-	-	1,650	2,200	3,000	4,350	7,100
	36-50	31-40	850	1,100	1,500	2,000	2,750	4,050	6,650
	36-50	41-50	700	950	1,300	1,800	2,500	3,700	6,100
36-50	51-60	-	750	1,100	1,500	2,150	3,250	5,300	

### Order example:

ZG KL 35 x 5000 / 700 E  
Lashing strap system 35, one-piece lashing strap, with cam buckle KL 14 and strap width 35 mm, length  $l_a = 5,000$  mm



# Lashing strap ZG 25

with ratchet RA 10

Our space-saving lashing strap system is ideal for direct lashing of very light loads in cars and on roof racks providing also for private purposes safe transportation according to regulations. Available with double J hook and a length of 4 m or as one-piece lashing strap with a length of 5 m.

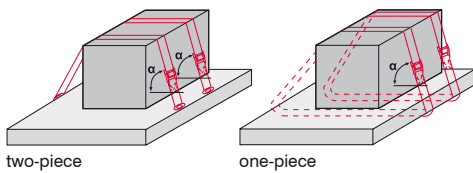
<b>Strap width</b>	<b>25 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	-
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	250 daN 
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	500 daN 



### Road transport applications:

#### Frictional lashing

This lashing strap is not designed for frictional lashing according to EN 12195. For special applications, please contact our technical service department.



Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
	$\alpha$ [°]	$\beta$ [°]	0.01	0.1	0.2	0.3	0.4	0.5	0.6
			The load can be secured with 4 Lashing straps [daN ~ kg]						
	15-35	21-30	-	-	-	850	1,150	1,600	2,450
	15-35	31-40	400	450	600	750	1,050	1,400	2,200
	15-35	41-50	300	400	500	650	900	1,250	1,900
	15-35	51-60	250	300	400	550	700	1,000	1,550
	36-50	21-30	-	-	550	750	1,050	1,550	2,500
	36-50	31-40	300	400	500	700	950	1,450	2,350
	36-50	41-50	250	300	450	600	850	1,300	2,150
	36-50	51-60	-	250	350	550	750	1,150	1,850

### Accessories:



#### Order example:

ZG 25 x 4000 / 250 Z RH  
Lashing strap system 25, two-piece lashing strap, with ratchet RA 10, strap width 25 mm and RH as end fittings, length  $l_G = 4,000$  mm



# Lashing strap ZG KL 25

with cam buckle KL 5

Our smallest lashing system according to load securing standards is ideal for securing and bundling very light loads in cars and for luggage lashing, available as a one-piece lashing strap with cam buckle and a length of 5 m.

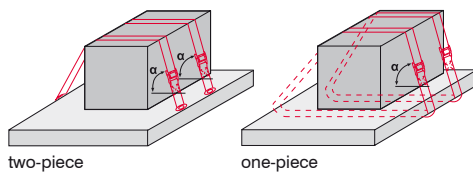
<b>Strap width</b>	<b>25 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	-
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	-
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	250 daN



## Road transport applications:

### Frictional lashing

This lashing strap is not designed for frictional lashing according to EN 12195. For special applications, please contact our technical service department.



Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
	$\alpha$ [°]	$\beta$ [°]	0.01	0.1	0.2	0.3	0.4	0.5	0.6
<p>two-piece</p>	15–35	21–30	-	-	-	850	1,150	1,600	2,450
	15–35	31–40	400	450	600	750	1,050	1,400	2,200
	15–35	41–50	300	400	500	650	900	1,250	1,900
	15–35	51–60	250	300	400	550	700	1,000	1,550
	36–50	21–30	-	-	550	750	1,050	1,550	2,500
	36–50	31–40	300	400	500	700	950	1,450	2,350
	36–50	41–50	250	300	450	600	850	1,300	2,150
	36–50	51–60	-	250	350	550	750	1,150	1,850

### Order example:

ZG KL 25 x 5000 / 250 E



Lashing strap system 25, one-piece lashing strap, with cam buckle KL 5 and strap width 25 mm, length  $l_g = 5,000$  mm



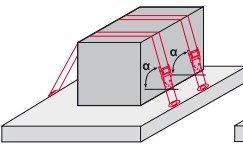
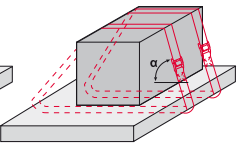
## Lashing strap ZG Roll

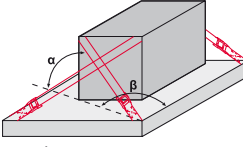
Quick-action lashing strap with ratchet and round hook. For the fast and simple securing of loads in passenger cars or trailers. Thanks to its ratchet system, the lashing strap may be rolled up at the touch of a button.



<b>Strap width</b>	<b>50 mm</b>
<b>STF</b> Standard tension force of the ratchet, important to determine the needed lashing straps for frictional lashing	75 daN
<b>LC – two-piece</b> Allowed lashing capacity of the lashing strap, important to determine the needed lashing straps for direct lashing processes	750 daN 
<b>LC – one-piece strap</b> Allowed lashing capacity of the lashing strap in strapping	- 

### Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle	Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	The load can be secured with 1 lashing strap [daN ~ kg]					
	90	10	30	60	110	180	330
	85	10	30	60	110	180	330
	80	10	30	60	110	180	330
	70	10	30	60	100	170	310
	60	10	30	50	90	160	290
	50	10	20	50	80	140	250
	40	10	20	40	70	120	210
	30	-	10	30	50	90	160

Direct lashing The load can be secured with 4 lashing straps	Angle		Dynamic friction factor						
	$\alpha$ [°]	$\beta$ [°]	0.01	0.1	0.2	0.3	0.4	0.5	0.6
	15–35	21–30	-	-	-	2,600	3,500	4,800	7,400
	15–35	31–40	1,200	1,450	1,850	2,350	3,150	4,300	6,700
	15–35	41–50	1,000	1,250	1,600	2,050	2,700	3,750	5,800
	15–35	51–60	750	1,000	1,300	1,650	2,150	3,050	4,750
	36–50	21–30	-	-	1,750	2,350	3,200	4,650	7,600
	36–50	31–40	900	1,200	1,600	2,150	2,950	4,350	7,100
	36–50	41–50	750	1,000	1,400	1,900	2,650	3,950	6,500
	36–50	51–60	-	850	1,150	1,650	2,350	3,450	5,650

### Order example:

ZG Roll 50 x 3000 / 750 RH

Lashing strap system ZG Roll with ratchet and

Double J hook Strap width 50 mm,

length  $l_G = 3,000$  mm

## Lashing winch ZW 50 x 10000 / 2500

incl. crank, for the securing of loads acc. to EN 12195

- Especially for the transport of long timber
- Admissible lashing capacity (LC) for straight pull: 2,500 daN  
Version with tensioning rod or ratchet is available upon request
- The standard version of the lashing winch comes with yellow, wear resistant webbing, protective sleeve for the labels and loop reinforcement



Standard tensioning force STF [daN]	for unrolled length [m]
500	6
600	7
750	8
850	9

Strap width	50 mm
LC – one-piece strap	2,500 daN
LC – in strapping	5,000 daN

### Road transport applications:

Frictional lashing The load can be secured with 1 lashing strap	Angle	Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
	$\alpha$ [°]	The load can be secured with 1 lashing strap [daN ~ kg]					
<p>two-piece      one-piece</p>	90	180	420	760	1,270	2,120	3,820
	85	180	420	760	1,270	2,110	3,810
	80	170	410	750	1,250	2,090	3,760
	70	170	390	710	1,190	1,990	3,590
	60	150	360	660	1,100	1,840	3,310
	50	130	320	580	970	1,620	2,930
	40	110	270	490	810	1,360	2,450
	30	90	210	380	630	1,060	1,910

### Direct lashing


Lashing strap is not designed for direct lashing.  
For special applications, please contact our technical service department.

### Order example:

ZW 50 x 10000 / 2500 D  
lashing winch system 50 incl. crank and Delta link  
Strap width 50 mm,  
length  $l_a = 10,000$  mm

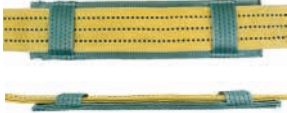
## AS Gummed protective sleeve

- Gummed, ideal for rough surfaces
- For sharp edges, we recommend to use an edge protector or a edge wear pad GS
- The standard design is not sewed on the sling, so the sleeve can be moved along the sling. On request also available sewed on the material of the sling

AS Protective sleeve	Type	Lashing strap system [mm]
	AS 38	25 / 35
	AS 52	48 / 50
	AS 65	75

## GS Edge wear pad

- Three-layer, therefore very effective
- made of Polyester PES
- Length 500 mm, special lengths and special widths on upon request

GS Edge wear pad	Type	Lashing strap system [mm]
	GS 50	25 / 35
	GS 75	48 / 50
	GS 90	75

## Protective sleeve for labels

Additional protective sleeve for the load capacity/lashing capacity label is available upon request. If required, the protective sleeve for the label may also be stitched onto the webbing. As lashing straps and webbing slings without labels must be decommissioned, protective sleeves for the label may significantly extend the lifespan of textile lashing and lifting equipment.





## KSPAD Edge protection pad

- With slits for inserting straps up to a width of 50 mm
- May also be used as a base for the ratchet to protect the loaded goods



## KSM Edge protection made of metal

- Protection for the strap and loaded goods thanks to large-surface pressure distribution
- May be used for straps up to a width of 50 mm



## KSP Edge protection made of PVC

- Protection for the strap and loaded goods thanks to large-surface pressure distribution
- May be used for straps up to a width of 50 mm



## KSSCH Edge protection rail


- High stability thanks to double-moulded units
- Ideal for securing and protecting goods on pallets
- Available in a range of standard lengths; custom designs available upon request





## ARM Anti-slide pad

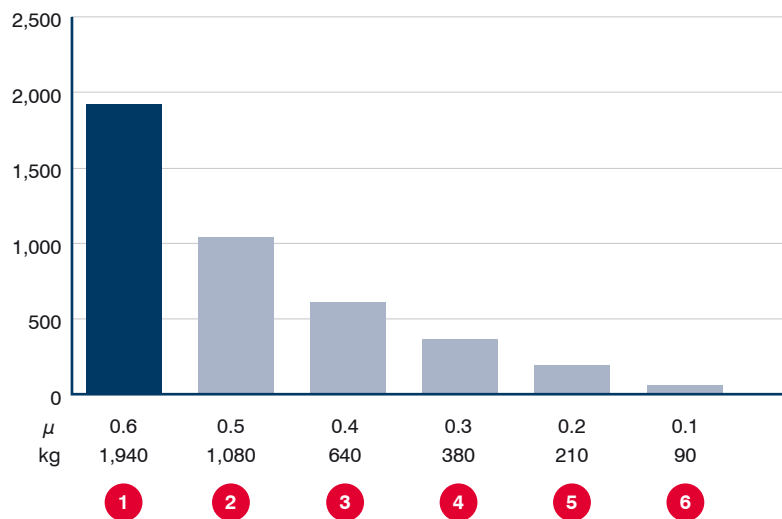
Durable anti-slip mats; ideal for securing loads. Reduces the number of lashing straps required for lashing-down operations by increasing the dynamic friction factor.

Anti-slide pad	Type	dimensions [mm]	thickness [mm]	friction coefficient	weighth [kg/pc.]
	ARM 10 x 20	100 x 200	8	$\mu > 0.60$	0.15
	ARM 20 x 20	200 x 200	8	$\mu > 0.60$	0.30
	ARM 20 x 24	200 x 240	4.50	$\mu > 0.60$	0.10



Tested anti-slip mats; ideal for securing commercial loads. Useable for loads up to 82.50 t / m<sup>2</sup>. Friction factor with 10 t / m<sup>2</sup> depending on the friction partner up to 1.49  $\mu$ . Extremely robust and designed for multiple use. Sealed surface means that no liquid is able to penetrate the material, thereby also preventing frost formation. Available in a pre-cut design with 20 x 24 cm. Other dimensions and/or complete rolls are available upon request.

**Example: load to be lashed down with 1 lashing strap:**  
Angle of inclination  $\alpha = 60^\circ$  and ratchet RA ERGO DZ 100 (STF=500 daN)

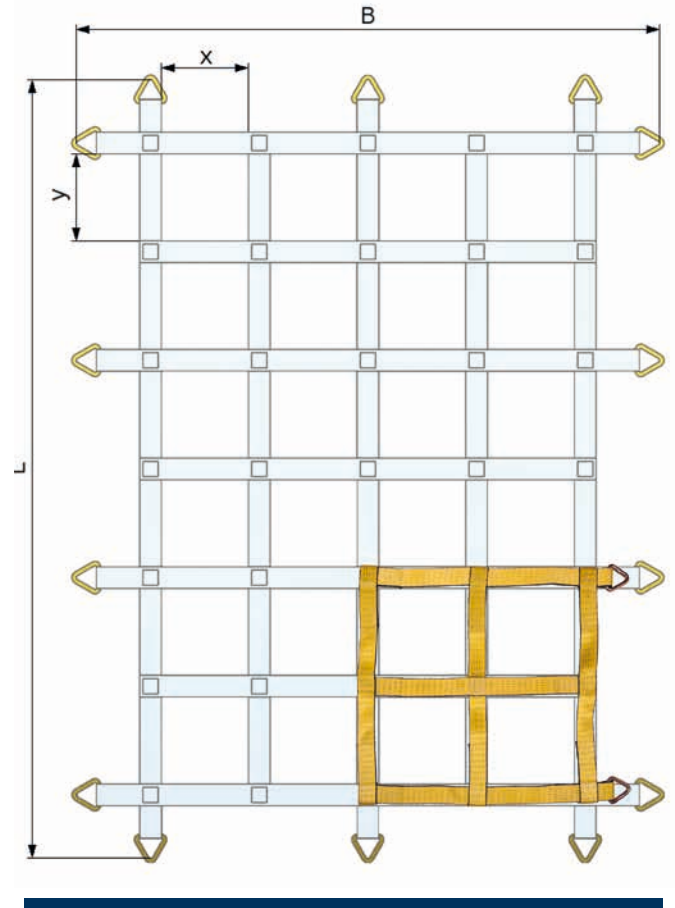


- 1 with ARM anti-slip mat
- 2 Concrete on concrete (no intermediate layer)
- 3 Concrete on wood (with wooden intermediate layer)
- 4 Big Bags on wooden pallets
- 5 Euro pallets (wood) on plywood
- 6 Oiled steel plates on oiled steel plates



## Load-securing nets

- Ideal for securing divided and palletized loads and/or to divide the loading space
- Available in a range of dimensions with strap widths from 25 to 50 mm for use in trucks, vans and passenger cars
- In combination with our tried-and-tested pewag lashing strap programme, we are able to provide complete load-securing solutions with our nets and tensioning elements



## Cargo nets

Knotted cover nets made from polypropylene and including a tension cord serve to secure loads primarily in passenger cars, on pallets or on trailers. Available in different dimensions and rope thicknesses.

Cargo net with tension line, made of polypropylene, loose packed	dimensions [mm]	detail
	1,250 x 2,100	rope 3 mm, width of mesh 45 mm
	1,500 x 2,500	rope 3 mm, width of mesh 45 mm
	2,000 x 3,000	rope 6 mm, width of mesh 45 mm
	2,500 x 3,500	rope 6 mm, width of mesh 45 mm
	3,000 x 3,500	rope 6 mm, width of mesh 45 mm
	3,000 x 4,000	rope 6 mm, width of mesh 45 mm
	3,500 x 5,000	rope 6 mm, width of mesh 45 mm
	3,500 x 6,000	rope 6 mm, width of mesh 45 mm

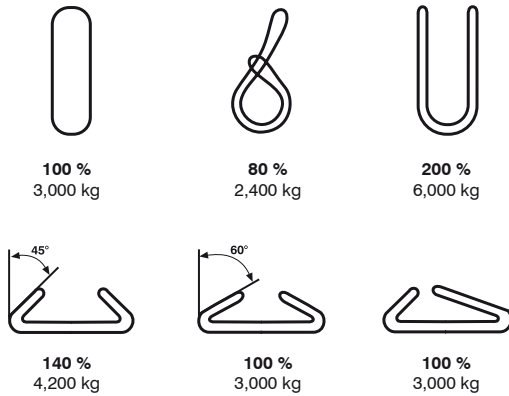


# Selecting the right textile lifting equipment

## The correct working load limit

All our webbing slings and round slings are labelled with their load capacity in accordance with EN 1492. However, the load capacity also depends on the type of application.

Let's take a 3 t round sling as an example:



## Edge-loading

Textile lifting equipment must be protected against sharp edges, friction and abrasion caused by the load/the hook in order to guarantee safety and a long lifespan.

## Areas of application

Different materials have different properties. pewag lifting straps and round slings are made from polyester and therefore subject to the following limitations:

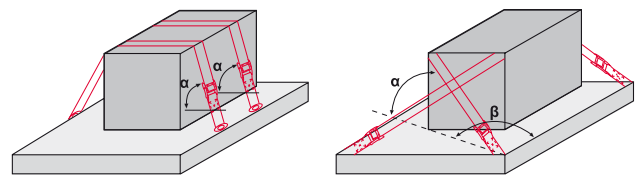
- Working temperature: -40 °C bis 100 °C – In temperatures below 0 °C, damp lifting devices may not be used to prevent ice formation
- Use in acids and caustic solutions or exposure to their vapours is not permitted

## Term of expiration

PES is photo- and heat-stabilised and is not subject to any term of expiration. The terms of expiration that used to be mandatory no longer apply; i.e. the manufacturing date that is printed on the label is not relevant for usage.

# Selecting the right textile lashing equipment

## Type of lashing application



### Frictional lashing

For securing heavy loads, a high **STF value** is important.

- Use at least 2 lashing straps

### Direct lashing

For securing heavy loads, a high **LC value** is important.

- Use at least 2 pairs of lashing straps

Size, shape and weight of the load determine the selection and application of textile lashing equipment. For instance, long timber is secured exclusively by frictional lashing, whereas heavy vehicles are more effectively secured by direct lashing.

## Edge-loading

We speak of edge-loading if the radius of the edge is smaller than the belt density. If this is the case, abrasion and/or edge protection must be used. Abrasion protection may also significantly extend the lifespan of a lashing strap, for instance on rough surfaces.

## Areas of application

Lashing straps are made from different materials, all of which have different properties. pewag lashing straps are made from polyester (PES) and therefore subject to the following limitations:

- Working temperature: -40 °C bis +120 °C – In temperatures of below 0 °C, damp lashing devices may not be used to prevent ice formation
- Use in acids and caustic solutions or exposure to their vapours is not permitted

## Term of expiration

PES is photo- and heat-stabilised and is not subject to any term of expiration. The terms of expiration that used to be mandatory no longer apply; i.e. the manufacturing date that is printed on the label is not relevant for usage.

# User manual

## for pewag textile lashing straps

### User manual

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pewag Laser-protractor	61
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# User manual

**This user manual provides information about the use, storage, inspection and maintenance of pewag textile lashing straps.**

## General information

pewag textile lashing straps are designed for securing the load during its transport. If properly used, pewag textile lashing straps have a long service life and offer a high degree of safety. Nevertheless, personal injury and material damage can only be prevented by proper use. It is therefore of vital importance to read and understand this manual before the product is put into service. However, this does not exclude a responsible and attentive use of textile lashing straps when securing the load. Although pewag offers the necessary help means for the correct selection and application of lashing straps, adequate professional knowledge is required. pewag textile lashing straps must therefore only be used by competent personnel.

## Modification of the original condition

A modification of the original condition of this product is not permitted – e.g. by bending, grinding, dividing parts, boring, etc. Moreover, they must not be subjected to temperature influences above 100 °C.

For safety reasons, it is not permitted to remove safety devices like triggers, safety pins, safety catches, safety bushes, etc. Surface coating procedures like hot dip galvanizing or electrogalvanizing are not permitted. Stripping and pickling are also dangerous processes and must not be carried out without the approval of pewag. In case of doubt, please contact our technical service department.

## Storage

pewag textile lashing straps must be stored clean, dry and protected from corrosion.

## Inspections

Before the first use, following criteria must be satisfied:

- the delivered lashing strap corresponds to the ordered product
- the information given by the marking and the lashing capacity on the label coincide with the designated application
- the lashing strap is provided with the corresponding file
- this operating manual is available and was read and understood by the user

Lashing straps must be checked before each use for visible signs of damage or wear. In the case of doubt or damage, they must be taken out of service and inspected by a competent person.

An inspection according to national regulations must be carried out at least once a year by a competent person. However, this period must be shortened in view of the conditions of use – e.g. in case of frequent or rough use.

After extraordinary events (e.g. uncontrolled temperature influence, emergency braking etc.) which could affect the safe working condition, the lashing strap must be inspected by a qualified person.

### Withdrawal criteria for the visual inspection

The lashing strap must be taken out of service if one or more of the following criteria are met:

- Broken parts or broken fibres / seams
- Missing or illegible marking on the label
- Deformation of accessories
- Lashing straps must be discarded if wear has reached 10 % of the cross section
- Cuts, nicks, gouges, cracks, excessive corrosion, coating-burn off, signs of welding processes
- If the ratches, cam buckles or tighteners are not working correctly
- Lashing straps with knots
- If the safety catch is missing or not working correctly, as well as signs of enlarged throat opening of the hooks or other deformations. The enlargement of the hook opening must not exceed 10 % of the nominal size

### Repair

Lashing straps must not be repaired.

### Documentation



Records of inspections, especially the corresponding results, must be retained during the entire service life of the lashing strap.

## Use of lashing straps

### Limitations on use due to adverse environmental influences or hazardous conditions.

#### Edge load

The maximum lashing capacity of pewag textile lashing straps was defined under the assumption that the tension force is set in straight pull, i.e. redirected free of bending influences (edges). In case of edge load, edge protectors or intermediate layers must be used to prevent damages. Edge load appears if the edge radius is smaller than the strap thickness.

Edge load lashing strap	Reduction factor
R = bigger than strap thickness 	1
R = smaller than strap thickness 	not allowed

### Impacts

If the lashing process is carried out according to the European Standard EN 12195-1, occasional impact loads do not need to be considered since they will be balanced out by the shock absorber system of the vehicle and the elasticity of the lashing strap.

### Temperature influence

pewag lashing straps may not be used outside the temperature range -40 °C up to +100 °C. If this has nevertheless been the case, they must be immediately taken out of service.

### Influence of acids / alkalis and chemicals

Do not subject pewag lashing straps to acids, alkalis or their vapors.

### Hazardous conditions

The categorization of the maximum lashing capacity assumes the absence of extremely dangerous conditions. Such extremely dangerous conditions include securing potentially dangerous loads, such as liquid metals, caustic or nuclear material. In these cases, the extent of the risks and the correct lashing capacity are to be assessed by competent personnel.

### Use of pewag textile lashing straps for other than the intended purposes

pewag textile lashing straps must only be used for lashing purposes. For other than the intended purposes, please contact our technical service. Do not use lashing straps for lifting purposes.

### General information:

#### Lashing points

Choose lashing points so that the angles of the lashing straps are within the range given in our help tables and symmetrical to the driving direction. Only use lashing points with adequate strength. Any other applications are only permitted with prior approval of our technical service department.

#### Selection

The lashing strap must be selected according to the required lashing method and the load that needs to be secured. The size, form and weight of the load, as well as the intended lashing method (friction lashing, direct lashing ...) and transport environment (additional utilities, lashing points ...) are essential to enable the proper selection of the lashing strap. For friction lashing, please use only those lashing straps where a STF value is given on the label.

We recommend using direct lashing for securing heavy loads in order to use as few as possible lashing straps.

The number of lashing straps must be calculated according to EN 12195-1. In accordance with this standard, pewag has integrated commonly used lashing methods in the selection tables of this catalog. Please find more detailed information below.

For stability reasons, use at least two lashing straps for friction lashing and at least two pairs for direct lashing.

The chosen lashing strap must be strong and long enough for the intended purpose. In case of doubt, opt for safety rather than for overloading the lashing strap. The connecting parts of the lashing strap (hooks, links) must be free to move in the lashing point and be aligned in the pull direction. Bending stress on the accessories and tip loading of the hooks is not permitted.

Hooks must be loaded at their bearing point. Please use either lashing chain systems or lashing straps for securing the load because of their different performance and elongation under load (e.g. lashing chains and lashing straps made from synthetic fibre). If required, please contact our technical service department.

### Use

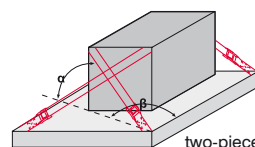
For correct lashing practice, the lashing method as well as opening of the lashing strap must be planned before the lashing process. Consider possible partial unloading during long trips.

Pay attention to overhead lines during loading and unloading. Remove possible lifting equipment before starting the lashing process. The maximum hand force of 50 daN for tightening the tension device must only be applied manually. Do not use mechanical devices such as rods or levers. Use sufficient edge protectors or edge wear pads. Please take into consideration that lashing straps could swing and rub due to winds. During transport, check the tension of the lashing strap repeatedly. Increasing temperatures can lead to a decreasing of the tension force in the lashing strap. Before opening the lashing strap, the load must be checked to ensure that it is properly supported and stable without the lashing system. It must also be guaranteed that there are no people in danger because of the load falling or toppling over. If necessary, assemble possible lifting equipment on the load before the transport to avoid falling off or toppling down. Special ratchets which allow a gradual loosening of the tension force are also very helpful in these cases. Before unloading, loose the lashing straps in such a way that the load stays on itself.

## Explanation of pewag tables

### Direct lashing

- The table provides information on how to use pewag textile lashing straps in an optimal way
- It also provides the maximum load which can be secured with 4 equal lashing straps using the angles and dynamic friction factors defined in the table. Additional securing methods (i.e. wedges, or similar) have not been taken into account. These could be used to secure loads with even higher weights. In such cases, please contact our customer service
- Every lashing strap has its own table
- The maximum forces occurring due to acceleration, braking and avoidance maneuvers in road traffic according to EN 12195-1 were taken into account. This table is not applicable for rail and sea transport. In such cases, please contact our customer service
- When using lashing straps, please consider if the values defined in the tables are valid for one-piece lashing straps (in strapping) or two-piece lashing straps (direct lashing) – see figures. For one-piece lashing straps, the corresponding tabular values for two-piece lashing straps of the same system can be doubled



**Maximum loading weight using 4 lashing straps ZG ERGO DZ 100, direct lashing method:**

Angle		Dynamic friction factor						
		0.01	0.1	0.2	0.3	0.4	0.5	0.6
$\alpha$ [°]	$\beta$ [°]	Load that can be secured with 4 straps [daN ~ kg]						
15-35	21-30				8,800	11,700	16,050	24,750
15-35	31-40	4,000	4,850	6,150	7,950	10,500	14,450	22,350
15-35	41-50	3,350	4,150	5,300	6,950	9,050	12,500	19,400
15-35	51-60	2,600	3,300	4,350	5,600	7,300	10,200	15,950
36-50	21-30			5,900	7,850	10,750	15,650	25,400
36-50	31-40	3,150	4,050	5,350	7,200	9,950	14,550	23,800
36-50	41-50	2,650	3,450	4,700	6,400	8,950	13,250	21,800
36-50	51-60		2,800	3,950	5,500	7,800	11,600	18,900

$\alpha$  is the angle formed between the lashing strap and the supporting area.  
 $\beta$  is the angle formed between the lashing strap, if it would lay on the supporting area (angle  $\alpha = 0$ ), and the driving direction.

**How can I use the table?**

**Method 1:**

- Determine the dynamic friction factor – for reference values, please see below
- Please verify with help of the table if the load can be secured safely with the chosen lashing strap and the determined friction factor (if not, please choose a different lashing strap or increase the friction, e.g. with anti-slide mats)
- Please verify if the lashing strap can be attached correctly using the specified angles. Use only those angles where the tabular value “load that can be secured using 4 straps” is higher than the real load

**Example:**

Lashing mean = lashing strap ZG ERGO DZ 100; load = steel part, 5,000 kg, loading area = steel

The dynamic friction factor is 0.2. As shown in the table, there are more angles which can be used for securing a 5,000 kg load with a ZG ERGO DZ 100 lashing strap and the mentioned dynamic friction factor. Please check now if the four lashing straps can be attached with these angles. Attention: As shown in the table, ZG ERGO DZ 100 is not enough to secure the load if the dynamic friction factor is lower. Please make sure that the load and the loading area are clean on the contact surface and that dirt does not reduce the friction factor.

**Method 2:**

- Determine the dynamic friction factor – for reference values, please see below
- Determine at which angles the load can be safely secured on the carrier
- Check with help of the table if the load can be safely secured with the determined dynamic friction factor and angles. If this is not the case, please choose a stronger lashing strap

**Example:**

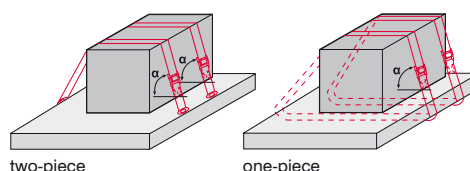
Lashing mean = lashing strap ZG ERGO DZ 100; Load = steel part, 5,000 kg; loading area = steel; two lashing points with possible angles: Lashing point 1:  $\alpha = 31^\circ$ ,  $\beta = 56^\circ$ ; lashing point 2:  $\alpha = 21^\circ$ ,  $\beta = 45^\circ$ .

The dynamic friction factor is 0.2. At the angles from lashing point 1, the maximum loading weight with factor 0.2 is 4,350 daN. This lashing point is, therefore, not allowed to be used with ZG ERGO DZ 100 lashing straps. At lashing point 2, the max. loading weight is 5,300 daN. This lashing point can be

used. Attention: Please make sure that the lashing capacity of the lashing point is high enough!

## Explanation of pewag tables Friction lashing

- This table provides information on how to use pewag textile lashing straps in an optimal way
- It also provides the maximum load which can be secured with one lashing strap and the specified angles and dynamic friction factors. Please note that for friction lashing methods, a minimum of 2 lashing systems are needed. Additional securing methods (e.g. wedges) have not been taken into account. These could be used to secure loads with even higher weights. In such cases, please contact our customer service
- The values in the table are applicable in the event that the tension force (STF) in the lashing strap is not the same on both sides of the load due to edge loading. If this can be guaranteed (e.g. using a pretensioning gauge), the values in the table may be increased by a factor of 1.3
- The maximum loading weight depends on the STF value of the tensioning system – the value is shown on the lashing system’s label. Each lashing tensioning system has its own table
- The maximum forces occurring due to acceleration, braking and avoidance maneuvers in road traffic according to EN 12195-1 were taken into account. Other tables are applicable for rail and sea transport. In such cases, please contact our customer service



**ZG ERGO DZ 100 (STF = 500 daN), method friction lashing:**

Angle		Dynamic friction factor					
		0.1	0.2	0.3	0.4	0.5	0.6
$\alpha$ [°]		Load that can be secured with 1 strap [daN ~ kg]					
90		100	250	450	750	1,250	2,250
85		100	240	440	740	1,240	2,240
80		100	240	440	730	1,230	2,210
70		100	230	420	700	1,170	2,110
60	90	210	380	640	1,080	1,940	
50	80	190	340	570	950	1,720	
40	60	160	280	480	800	1,440	
30	50	120	220	370	620	1,120	

$\alpha$  is the angle formed between the lashing trap and the supporting area

**How can I use the table?**

- Determine the dynamic friction factor – for reference values, please see below

- Please determine at which angle,  $\alpha$ , the load can be safely secured on the carrier – the bigger the better
- For the given values (dynamic friction factor, angle), determine with help of the table the maximum loading weight that can be safely secured by a lashing strap. If the determined angle cannot be found in the table, please choose the next smallest one
- Determine how much bigger the real load in comparison with the tabular value is. This value, rounded up, constitutes the minimum number of lashing straps to be used. Please note that for friction lashing processes at least 2 lashing straps have to be used

**Example:**

Lashing strap = ZG ERGO DZ 100 (STF = 500 daN); load = 5,000 kg; dynamic friction factor = 0.4; the provided lashing points formed an angle  $\alpha = 85^\circ$ :

As seen in the table, at  $\alpha = 85^\circ$  and with a dynamic friction factor of 0.4 - 740 kg can be secured with each lashing strap. I.e. for 5,000 kg ( $5,000/740 = 6.8$ ) 7 lashing straps are needed. From this example, it can be seen that especially heavy loads should not be secured by friction lashing, since many lashing straps are required.

## pewag Laser-protractor

The evaluation of the angles  $\alpha$  and  $\beta$  is vital for the planning of the lashing system. With the pewag LashMate laser-protractor it's possible to determine the angles before the lashing straps are attached to the load.

The built-in laser beam simulates the connection between the load and the lashing point, the angle can now be easily seen on the scale of the protractor.

Tables with lashing capacities for all pewag lashing straps are integrated to determine the right amount and type of lashing straps.



## Dynamic friction factors of some usual goods

Combination of materials on the contact surface	Friction factor $\mu_D$
<b>Sawn wood</b>	
Sawn wood against fabric base laminate / plywood	0.35
Sawn wood against grooved aluminium	0.30
Sawn wood against steel sheets	0.30
Sawn wood against shrinkage foils	0.20
<b>Crimped foils</b>	
Shrinkage foils against fabric base laminate / plywood	0.30
Shrinkage foils against grooved aluminium	0.30
Shrinkage foils against grooved aluminium steel sheets	0.30
Shrinkage foils against shrinkage foils	0.30
<b>Cardboard boxes</b>	
Cardboard box against cardboard box	0.35
Cardboard box against wood pallet	0.35
<b>Large bags</b>	
Large bags against wood pallet	0.30
<b>Steel and metal sheets</b>	
Oiled metal sheets against oiled metal sheets	0.10
Flat steel bars against sawn wood	0.35
Unpainted rough steel sheets against sawn wood	0.35
Painted rough steel sheets against sawn wood	0.35
Unpainted rough steel sheets against unpainted rough steel sheets	0.30
Painted rough steel sheets against painted rough steel sheets	0.20
Painted steel barrel against painted steel barrel	0.15
<b>Concrete</b>	
Wall on wall without intermediate layer (concrete / concrete)	0.50
Finished part with wooden intermediate layer on wood (concrete / wood / wood)	0.40
Ceiling on ceiling without intermediate layer (concrete / lattice girder)	0.60
Steel frame with wooden intermediate layer (steel / wood)	0.40
Ceiling on steel frame with wooden intermediate layer (concrete / wood / steel)	0.45
<b>Pallets</b>	
Resin bonded plywood, smooth – Europallet (wood)	0.20
Resin bonded plywood, smooth – box pallet (steel)	0.25
Resin bonded plywood, smooth – plastic pallet (PP)	0.20

Combination of materials in the contact surface	Friction factor $\mu_D$
<b>Pallets</b>	
Resin bonded plywood, smooth – wooden pressboard pallets	0.15
Resin bonded plywood, sieve structure – Europallet (wood)	0.25
Resin bonded plywood, sieve structure – box pallet (steel)	0.25
Resin bonded plywood, sieve structure – plastic pallet (PP)	0.25
Resin bonded plywood, sieve structure – wooden pressboard pallets	0.20
Aluminium beams in the load-carrying platform (punched bars) – Europallet (wood)	0.25
Aluminium beams in the load-carrying platform (punched bars) – box pallet (steel)	0.35
Aluminium beams in the load-carrying platform (punched bars) – plastic pallet (PP)	0.25
Aluminium beams in the load-carrying platform (punched bars) – wooden pressboard pallets	0.20

- Friction coefficients according to the standard EN 12195-1, values are valid for clean surfaces under optimal conditions
- Warning: dirty, wet or icy surfaces reduce friction factors. Please consider that this can also happen during the transport depending on the season
- Please choose only those values which you can really guarantee. In case of doubt, choose the lower value – it is your own safety

# User manual

This user manual provides information about the use, storage, inspection and maintenance of pewag textile webbing slings and round slings.

## Conditions of use

pewag webbing slings and round slings are designed only for slinging and lifting loads according to the pertinent, European and national norms with exception of the limitations of use specified below. This product must only be used by qualified, competent personal in accordance with the European standard EN 1492, Part 1, Annex D or Part 2, Annex C, as well as with national regulations. Reading and understanding the operating manual is a precondition for putting this product into service.

## Limitations on use

### Due to adverse environmental influences or hazardous conditions

- Use with chemicals: the use with alkalis is not permitted (leaches). In case of suspicion of high concentrations of acids or alkalis (even in form of vapors), take the product out of service. In case of doubt, please contact the manufacturer, also for cleaning processes. Metal fitting elements must not be subjected to acid influences
- Permitted operating temperature: -40 °C up to +100 °C. Do not use humid webbing slings/round slings at low temperatures if there is danger of freezing
- When using round slings/webbing slings for lifting loads with sharp edges or rough surfaces, please consider sufficient protection (edge protection corners when edge radius < webbing sling/round sling width; protective sleeves for rough surfaces)
- Avoid exposure to ultraviolet light and direct sunlight during use and storage

## Before the first use

- Check that the delivered webbing sling/round sling corresponds to the ordered product
- Check that the manufacturer's certificate is provided with the product
- Check that the information given by the marking and the working load limit coincide with the certificate
- Check that this operating manual is available to the user and was read and understood by the corresponding personnel

## Before each use

Visual check: during the visual inspection, pay attention to visible signs of damage and marking. In the case of doubt or if one or more of the following criteria are met, take the webbing sling/round sling out of service.

- Worn and rubbed parts, especially if they are localised
- Cuts
- Broken seams
- Visible core or damaged sheath of the round sling
- Softened or brittle fibers
- Shiny appearance because of overheating or melting
- Deformed or damaged end fittings
- Illegible or missing label

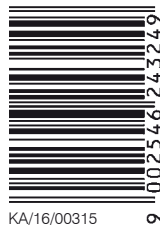
## Selection and use

- Determine the loading weight (mass) and centre of gravity. Choose the correct lashing points and type of sling
- The maximum working load limit (WLL) must not be exceeded. When using multi-leg slings, please use finished assemblies or contact the manufacturer for information about inclination angles and the working load limit of the entire assembly. When using pewag round slings/webbing slings under other circumstances than those described in Conditions of use (e.g. asymmetrical load distribution or choke hitch), a reduction of the WLL must be applied
- Round slings and webbing slings must be attached in a way so that the load is carried by the whole width of the textile sling (also on the crane hook). Pay special attention to crane hooks and sling parts: the angle formed with the loop of the sling must not exceed 20°. In case of doubt, do not use loop slings type B2 or too wide textile slings, use metal end fittings instead
- Use adequate lifting points with sufficient strength. Webbing slings/round slings must not be knotted, twisted or extended by means of a choke hitch. The opening angle of the end loop must not exceed 20°. Use only approved lifting techniques and take the max. WLL specified on the label into consideration, e.g. when using a choke hitch
- Seams and labels must be positioned on the straight part of the sling, never on the supporting area. Protect sensible loads against rubbing or pressure by using webbing slings/round slings. Do not pull loads with webbing slings and round slings over the ground or rough surfaces
- Ensure that the load is secured against falling down, sliding or tilting. Attach the webbing sling/round sling in a way so that the center of gravitation lays direct below the center of the hook bow
- Round slings/webbing slings must not be twisted or knotted
- Avoid shock loading
- Workers must abandon the danger zone during the lifting process. Hands and other parts of the body must be kept away to prevent injury as the slack webbing sling/round sling is taken up. The preparation and management of the lifting process, as well as safety work systems must be according to ISO 12480-1. The load must be raised slightly. In the cases where the load begins to tilt, set down the load, remove the fault and perform a new lifting test. Avoid rotation or collision with other objects

- Protect delicate loads against pressure by the webbing slings/round slings. Pay special attention to the acting forces when using a choke hitch
- The load must be set down carefully; it must not be set down directly on the webbing sling/round sling
- Do not pull out webbing slings/round slings under the load with the load lying on them
- Webbing slings/round slings must be stored clean, dry, correctly aired, far away from heat sources and in racks. Avoid contact with chemicals, flue gases, corroded surfaces, direct sun light and sources of ultraviolet light (also when stored). Do not store damaged webbing/round slings. After being in contact with acids and alkalis, neutralise them with water or other adequate means before storage. Hang wet webbing/round slings to dry down

## Inspections and repair

- The webbing sling / round sling must be put out of service if one or more of the criteria described in the section “before each use” are met. In case of doubt, discard the sling. Inspections must be carried out by a competent person. The period between the inspections has to be defined by an expert under consideration of the conditions of use. However, an inspection must be done at least once a year
- Records of inspections and inspection protocols must be retained during the entire service life of the webbing sling/round sling
- In no case must webbing slings/round slings be repaired by the user



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