

# High strength chains for Hoists

Lifting and Moving





# Content

## Intelligent profile cross section

pewag, as an innovation leader,  
is the world's first supplier  
of a chain with an intelligent  
and stiff cross profile for  
lifting devices.

pewag offers a variety of  
high class and innovative  
chain types in the category  
of hoist chains as well as the  
support for the design  
of chain drives.

### 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.

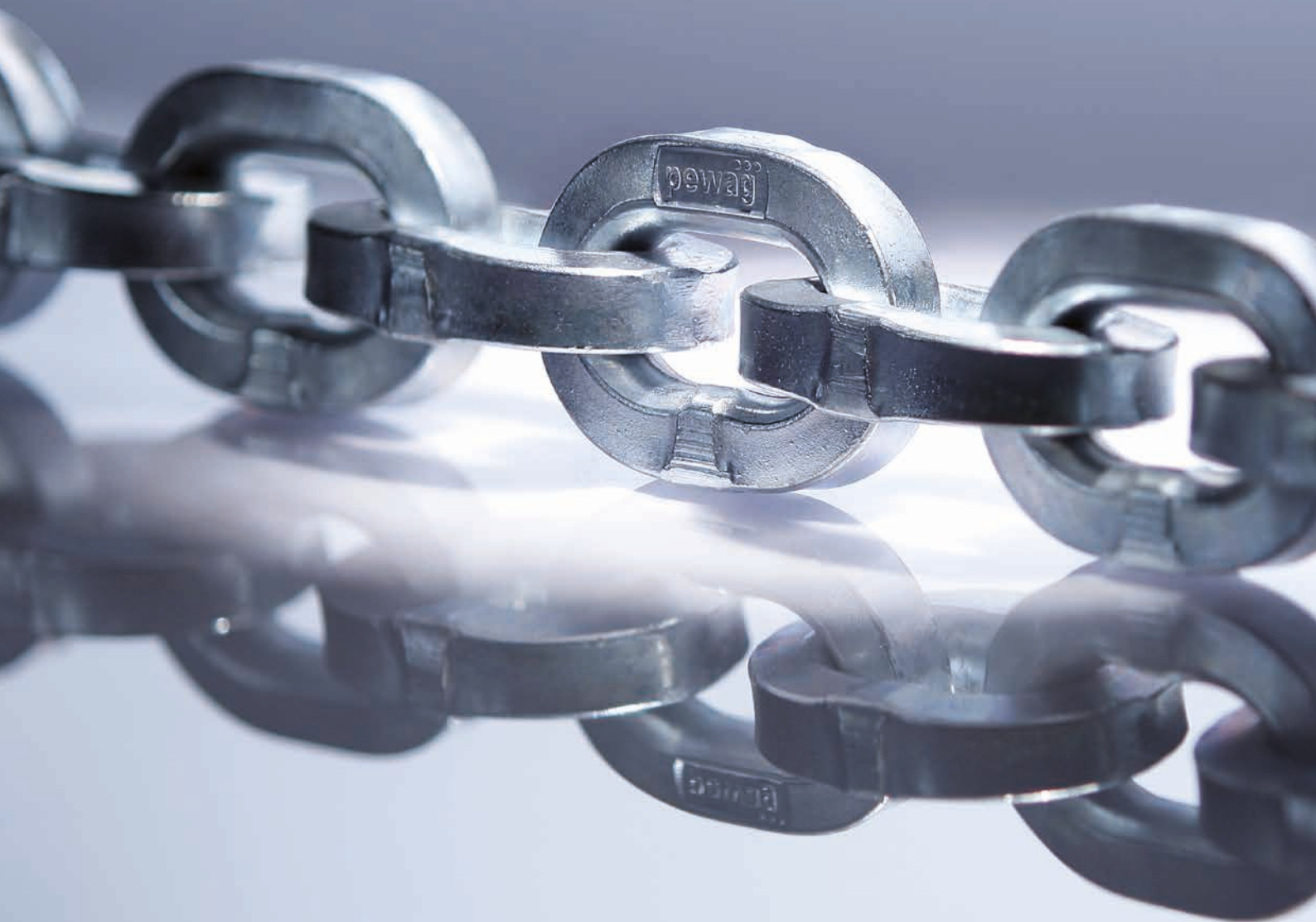
### Leading in Economics

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  
companies
- 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

### 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

## Environment – we take responsibility

### 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 40 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, Graz pewag Schneeketten GmbH, 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, Rijeka
The Netherlands	pewag nederland BV, Rijnsburg APEX International BV, Hillegom APEX Automotive BV, Hillegom
Poland	pewag polska Sp. z o.o., Buczkowice
Portugal	pewag Portugal – Comercio de Produtos e Equipamentos 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, Nováky
Czech Republic	pewag Czech sro, Vamberk Řetězárna Česká Třebová sro, Vamberk pewag sro, Vamberk pewag Czech sro, Česká Třebová 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
Canada	pewag Canada Inc., Mississauga
Mexico	pewag Mexico SA de CV, Mexico

### South America

Brazil	Helevar Comércio e Importação de Produtos Metalúrgicos Ltda., Porto Alegre
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 hoist chains

## Benefits and information

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## Advantages of pewag hoist chains

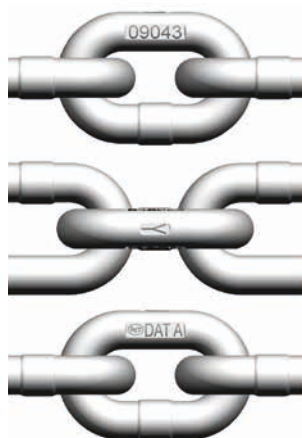
- Produced on state-of-the-art chain production machines for high dimensional accuracy and tight tolerances to ensure smooth run of the chains over chain wheels.
- Heat treated in environment friendly continuous working heat treatment systems for even hardness and strength of each individual chain link.
- High corrosion resistance and consistent quality of the zinc layer due to electrogalvanizing on pewag developed continuous working facility.
- Assurance of the high quality of pewag hoist chains in accordance with ISO 9001 quality assurance system.
- Stamped with a five-digit identification number ensuring traceability of production data and quality checks back to the raw material.
- For our customers: Research in cooperation with
  - Technische Universität Graz
  - Montanuniversität Leoben
  - Ruhruniversität Bochum
- Possibility of testing and development on our numerous test benches and test machines.
- High degree of flexibility in the customized production of hoist chains with specific dimensions and qualities according to our customer's specification.



Continuous heat treatment line



Continuous galvanizing line



Stamping

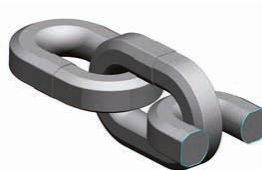


ISO-Certificate

## Profile steel chain

pewag is the first hoist chain manufacturer offering profile chains for hoists. Profile chains show several advantages, compared with round-steel-chains:

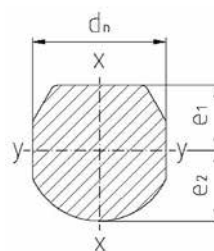
- 7% smaller chain diameter compared to round steel chains with same cross section areas. This enables a smaller chain drive and finally a smaller hoist.
- Increased bending resistance of the intelligent profile section provides a higher fatigue resistance and higher safety factor against fatigue breakages.
- Increased wear life time due to plane contact areas between chain, chain wheel and chain guide.



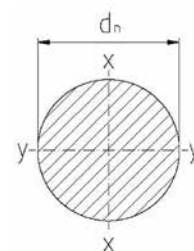
Profile steel chain



Round steel chain



Profile steel chain – Profile



Round steel – Profile

### Comparison of the section modulus

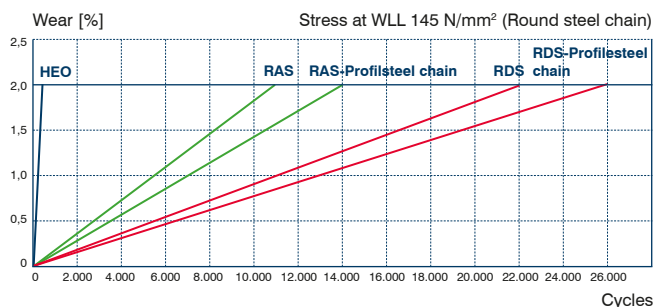
Data depending on cross section	Advantages profile chain	Profile steel chain	Round steel chain
Nominal diameter	-7%	d=11 mm	d=11,8 mm
Chain cross-section	+/- %	A=109,8 mm <sup>2</sup>	A=109,8 mm <sup>2</sup>
Bending section-module	+6,5%	W <sub>x</sub> =172,9 mm <sup>3</sup>	W <sub>xy</sub> =162,3 mm <sup>3</sup>
	+13,3%	W <sub>y1</sub> =183,9 mm <sup>3</sup>	W <sub>xy</sub> =162,3 mm <sup>3</sup>
	+1,7%	W <sub>y2</sub> =165,1 mm <sup>3</sup>	W <sub>xy</sub> =162,3 mm <sup>3</sup>

Profile steel chain vs. Round steel chain

## Wear values

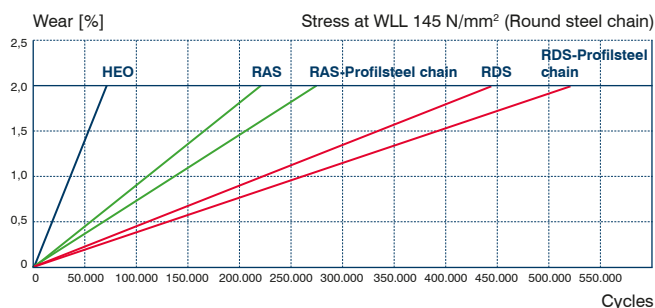
The values have been determined on the pewag test rig for dry and lubricated chains in one-strand-operation.

### Dry running condition



Wear test, dry chain

### Lubricated with motor oil



Wear test, chain lubricated

## Duty rating groups

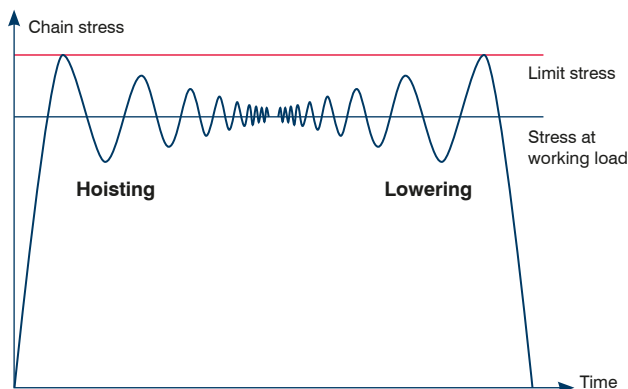
Depending on the intended usage, hoists are rated in duty rating groups according to ISO 4301-1. The duty rating group indicates the permissible working time and permissible utilization of the hoist equipment at full or partial load. Depending on the duty rating group, the safety factor of the chain (ratio of working and breaking load) is determined.

### Duty rating group according to ISO 4301-1

M1 Manual hoists  
M2, M3, M4, M5 Motor-driven hoists

## Permissible limit stress

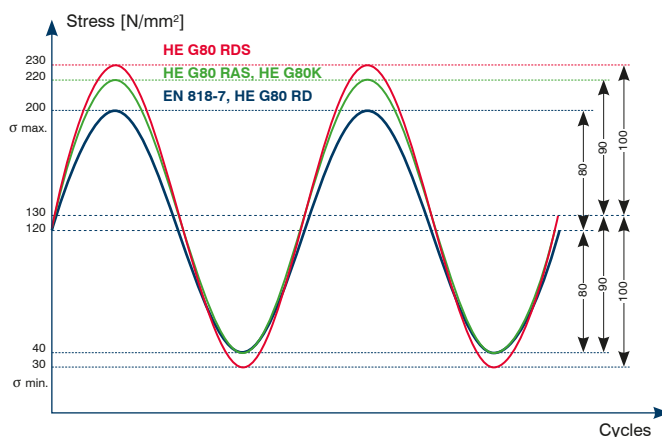
During hoist operations, it must be ensured that the maximum limit stress of the chain according to EN 818-7 and ISO 3077 is not exceeded. As chains run over the wheels oscillating forces are generated, which load the chain above the working load (polygone effect of the chain wheel, acceleration-, breaking shocks). The quotient „Limit stress / at working load limit“ is the shock-factor of the hoist.



$$\text{Max. shock factor} = \frac{\text{Limit stress}}{\text{Stress at working load}}$$

## Fatigue test

According to EN 818-7 and ISO 3077, hoist chains must be submitted to a fatigue test with a maximum stress of 200 N/mm<sup>2</sup> and a minimum stress of 40 N/mm<sup>2</sup> for more than 2 million cycles. pewag does subject the chains to a standard test at a higher maximum stresses of 220 N/mm<sup>2</sup> and 230 N/mm<sup>2</sup>.



# pewag hoist chains

## Types of chains

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Chain dimensions according to JIS B8812	17
Case hardened chains	18-20
Stainless steel chains	21-23
Through hardened chains	24-26







## Chain dimensions according to EN 818-7

The dimensions listed in the table are an extract of the EN 818-7 for round steel chains. Depending on the hoist design, the dimensions and tolerances can be varied according to the demand of our customers.

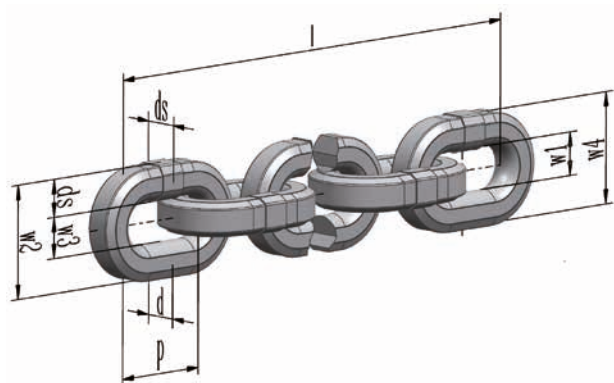


Profile steel chain

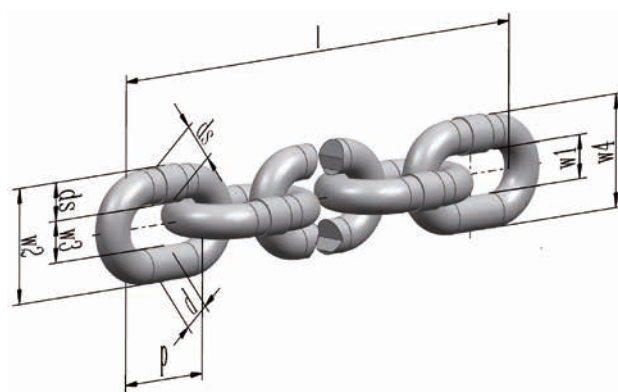


Round steel chain

Nominal dia		Pitch		Width		Multiple Pitch		Weld dia	Weight
d	Tolerance	p	Tolerance	inner w3-min.	outer w2-max.	11 x p	Tolerance	ds max.	[kg/m]
3	+/- 0,1	9	+0,10 / -0,05	3,6	10,2	99	+0,30 / -0,15	3,3	0,20
4	+/- 0,2	12	+0,15 / -0,01	4,8	13,6	132	+0,40 / -0,20	4,3	0,35
5	+/- 0,2	15	+0,20 / -0,10	6,0	17,0	165	+0,50 / -0,25	5,4	0,54
6	+/- 0,2	18	+0,20 / -0,10	7,2	20,4	198	+0,60 / -0,30	6,5	0,78
7	+/- 0,3	21	+0,25 / -0,15	8,4	23,8	231	+0,70 / -0,35	7,5	1,10
8	+/- 0,3	24	+0,30 / -0,15	9,6	27,2	264	+0,80 / -0,40	8,6	1,40
9	+/- 0,4	27	+0,35 / -0,15	10,8	30,6	297	+0,95 / -0,45	9,7	1,75
10	+/- 0,4	30	+0,35 / -0,15	12,0	34,0	330	+1,00 / -0,50	10,7	2,20
11	+/- 0,4	33	+0,40 / -0,20	13,2	37,4	363	+1,20 / -0,50	11,8	2,60
12	+/- 0,5	36	+0,45 / -0,20	14,4	40,8	396	+1,25 / -0,60	12,9	3,10
13	+/- 0,5	39	+0,50 / -0,25	15,6	44,2	429	+1,35 / -0,65	14,0	3,65
14	+/- 0,6	42	+0,55 / -0,25	16,8	47,6	462	+1,50 / -0,70	15,1	4,20
16	+/- 0,6	48	+0,60 / -0,30	19,2	54,4	528	+1,70 / -0,80	17,3	5,50
18	+/- 0,9	54	+0,70 / -0,30	21,6	61,2	594	+1,95 / -0,95	19,4	7,00
20	+/- 1,0	60	+0,80 / -0,40	24,0	68,0	660	+2,20 / -1,00	21,6	8,60
22	+/- 1,1	66	+0,90 / -0,40	26,4	74,8	726	+2,40 / -1,10	23,8	10,50



Chain dimensions profile steel chain



Chain dimensions round steel chain

## Chain dimensions according to JIS B8812

The dimensions listed in the table are an extract of the JIS B8812 for round steel chains. Depending on the hoist design, the dimensions and tolerances can be varied according to the demand of our customers.

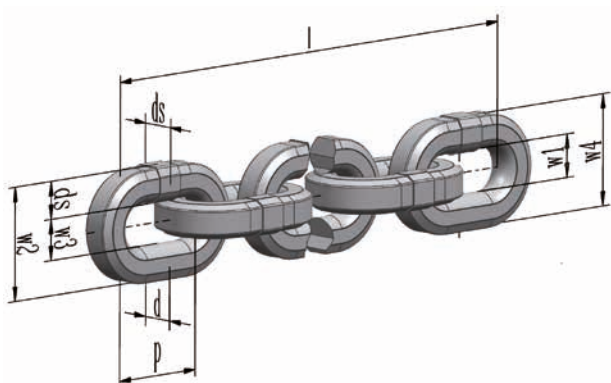


Profile steel chain

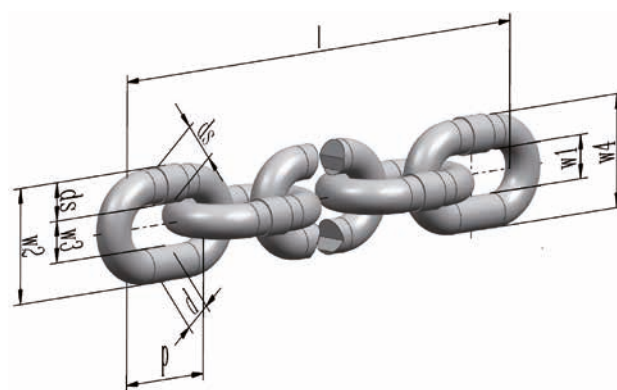


Round steel chain

Nominal dia		Pitch		Width		Width beside the weld		Multiple Pitch		Weld dia	Weight
d	Tolerance	p	Tolerance	inner w3-min.	outer w2-max.	inner w1-min.	outer w4-max.	11 x p	Tolerance	ds max.	[kg/m]
4,0	+0,08 / -0,24	12,0	+0,23 / -0,00	4,8	13,6	5,0	13,4	132,0	+0,60 / -0,00	4,3	0,35
5,0	+0,10 / -0,30	15,0	+0,29 / -0,00	6,0	17,0	6,3	16,8	165,0	+0,79 / -0,00	5,4	0,54
5,6	+0,11 / -0,34	17,0	+0,33 / -0,00	6,8	19,0	7,0	18,8	187,0	+0,90 / -0,00	6,0	0,68
6,3	+0,13 / -0,38	19,0	+0,35 / -0,00	7,7	21,4	8,0	21,1	209,0	+1,00 / -0,00	6,8	0,86
6,3	+0,00 / -0,10	19,1	+/- 0,20	7,4	21,0	7,6	20,8	210,1	+/- 0,50	6,8	0,85
7,1	+0,00 / -0,10	20,2	+/- 0,20	8,0	23,5	8,3	23,2	222,2	+/- 0,50	7,6	1,10
7,1	+0,14 / -0,43	21,0	+0,40 / -0,00	8,6	24,1	8,9	23,9	231,0	+1,10 / -0,00	7,6	1,10
7,9	+0,00 / -0,10	23,0	+/- 0,20	9,0	26,2	9,3	25,9	253,0	+/- 0,60	8,5	1,35
8,0	+0,16 / -0,48	24,0	+0,45 / -0,00	9,6	27,2	10,0	26,8	264,0	+1,20 / -0,00	8,6	1,40
9,0	+0,18 / -0,54	27,0	+0,52 / -0,00	11,0	30,5	11,3	30,2	297,0	+1,43 / -0,00	9,6	1,75
9,5	+0,00 / -0,10	28,6	+/- 0,20	11,0	31,7	11,4	31,3	314,6	+/-0,75	10,2	1,90
10,0	+0,20 / -0,60	30,0	+0,55 / -0,00	12,1	33,9	12,5	33,5	330,0	+1,55 / -0,00	10,7	2,20
11,1	+0,00 / -0,40	33,3	+/- 0,20	12,7	36,8	13,1	36,4	366,3	+/-0,85	11,9	2,65
11,2	+0,22 / -0,67	34,0	+0,65 / -0,00	13,6	37,9	14,0	37,5	374,0	+1,75 / -0,00	12,0	2,70
12,5	+0,25 / -0,75	38,0	+0,70 / -0,00	15,2	42,5	15,7	42,0	418,0	+2,00 / -0,00	13,4	3,40
12,7	+0,00 / -0,10	36,0	+/- 0,20	14,2	41,9	14,7	41,4	396,0	+/- 0,95	13,7	3,55
14,0	+0,28 / -0,84	42,0	+0,80 / -0,00	17,5	48,0	18,0	47,4	462,0	+2,20 / -0,00	15,1	4,25



Chain dimensions profile steel chain



Chain dimensions round steel chain



## Case hardened chains

### Mechanical and metallurgical properties for Round steel chain HE / Profile steel chain HEP

Different conditions require different chains. In order to optimize the cost-benefit ratio for your commitment, we divide our case hardened chains in three different types. Due to the optimized heat treatment process, the chains hardness and toughness can be tailored to your requirements.



Profile steel chain



Round steel chain

pewag Type	G80-RAS	G80-RDS	G80-RD
Type according to EN 818-7 und ISO 3077	DAT	DAT	DT
Min. stress at proof force $\sigma_{FP}$ [N/mm <sup>2</sup> ]	500	500	500
Min. breaking stress $\sigma_{FB}$ [N/mm <sup>2</sup> ]	800	800	800
Min. breaking elongation A [%]	10	10	5
Min. surface hardness [HV]			
dn ≤ 4 mm, HV 5 (1)	570	570	600
4 mm < dn < 7 mm, HV 5	580	580	620
dn ≥ 12 mm	580	580	620
Case hardening depth EHT [mm]			
dn < 8 mm	(0,04 +/- 0,01) x dn	(0,06 +/- 0,01) x dn	(0,06 +/- 0,01) x dn
8 mm ≤ dn < 12 mm	(0,03 +/- 0,01) x dn	(0,05 +/- 0,01) x dn	(0,05 +/- 0,01) x dn
dn ≤ 12 mm	(0,03 +/- 0,01) x dn	n/a	(0,03 +/- 0,01) x dn
Duty rating group according to ISO 4301-1	M2 / M3 / M4 / M5	M2 / M3 / M4 / M5	M2 / M3 (2) / M4 (2) / M5 (2)
Max. stress at working load limit $\sigma_F$ [N/mm <sup>2</sup> ]	160 / 160 / 140 / 125	160 / 160 / 140 / 125	100 / 100 / 90 / 80
Max. limit stress $\sigma_{Flim}$ [N/mm <sup>2</sup> ]	225 / 200 / 180 / 160	225 / 200 / 180 / 160	200 / 200 / 180 / 160
Material	Cr-Ni-Mo alloyed chain steel according to EN 818-7 und ISO 3077		
Label on the shipping unit - shape/color			
Marking / stamping	H16 DAT-A	H16 DAT-D	H16 DT-D
Upper temperature limit [°C]	200	200	200
Lower temperature limit [°C]	-20	-20	-10

## Case hardened chains

### Diameter-dependent properties

#### Type RAS

Case hardened chain with min. 580 HV surface hardness, 4% case-depth and 10% minimum breaking elongation. The chain exceeds the requirements of European hoist chain standard EN 818-7 and International Standard ISO 3077. The chain is particularly suitable for use in heavy duty motor driven (electric, pneumatic, hydraulic) hoist.

#### Type RDS

Case-hardened chain with min 580 HV surface hardness, 6% case depth and 10% minimum breaking elongation. Greater case depth of 6% and higher fatigue resistance than RAS type. Ideal chain for high-wear applications and high dynamic chain loads.

pewag Type		G80-RAS, -RDS					
Type according to EN 818-7 and ISO 3077		DAT					
Nominal dia. x pitch Round steel chain	Nominal dia. x pitch Profile steel chain	Capacity according to duty rating group ISO 4301-1 [kg]			Manufacturing proof force	Breaking force	Chain length
dn x p [mm]	dn x p [mm]	M2 / M3	M4	M5	FP [kN]	FB [kN]	[m]
3 x 9	2,8 x 8,4	230	200	180	7,1	11,3	100
4 x 12	3,7 x 11,1	410	360	320	12,6	20,1	100
5 x 15	4,7 x 14,1	640	560	500	19,6	31,4	100
5,6 x 17	5,2 x 15,6	800	700	630	24,6	39,4	100
6 x 18	5,6 x 16,8	920	810	720	28,3	45,2	100
6,3 x 19 (19,1)	5,9 x 17,7	1.000	890	790	31,2	49,9	100
7 x 21	6,6 x 19,8	1.250	1.100	1.000	38,5	61,6	100
7,1 x 20,2 (21)	6,6 x 19,8	1.300	1.150	1.000	39,6	63,3	100
7,9 x 23	7,4 x 22,2	1.600	1.400	1.250	49,0	78,4	100
8 x 24	7,4 x 22,2	1.650	1.450	1.300	50,3	80,4	100
9 x 27	8,4 x 25,2	2.100	1.800	1.600	63,6	102,0	100
9,5 x 28,6	8,8 x 26,4	2.300	2.000	1.800	70,9	113,0	100
10 x 30	9,3 x 27,9	2.550	2.250	2.000	78,5	126,0	100
11 x 33	10,2 x 30,6	3.100	2.700	2.400	95,0	152,0	100
11,1 x 33,3	10,3 x 30,9	3.150	2.750	2.450	96,8	155,0	100
11,2 x 34	10,4 x 31,2	3.200	2.800	2.500	98,5	158,0	100
12 x 36	11,2 x 33,6	3.700	3.250	2.900	113,0	181,0	100
12,5 x 38	11,6 x 34,8	4.000	3.500	3.150	123,0	196,0	100
12,7 x 36	11,8 x 35,4	4.150	3.600	3.250	127,0	203,0	100
13 x 39	12,1 x 36,3	4.350	3.800	3.400	133,0	212,0	100
14 x 42	13 x 39	5.000	4.400	3.900	154,0	246,0	50
16 x 48	14,9 x 44,7	6.550	5.750	5.150	201,0	322,0	50
18 x 54	16,7 x 50,1	8.300	7.250	6.500	254,0	407,0	50
20 x 60	18,6 x 55,8	10.300	8.950	8.000	314,0	503,0	50
22 x 66	20,5 x 61,5	12.500	10.900	9.700	380,0	608,0	50

#### Order example

100 m HE-chain WN G80 RAS 9x27 gzn

100 m HEP-chain WN G80 RAS 9x27 gzn

## Case hardened chains

### Diameter-dependent properties

#### Type RD

Case-hardened chain with min. 620 HV surface hardness, 6% case-depth and 5% minimum breaking elongation. Higher wear resistance than RDS type, for use in particularly hard-wearing conditions. Use in foundries and dirty environments where wet lubrication of the chain is not possible.

pewag Type		G80-RD					
Type according to EN 818-7 and ISO 3077		DAT					
Nominal dia. x pitch Round steel chain	Nominal dia. x pitch Profile steel chain	Capacity according to duty rating group ISO 4301-1 [kg]			Manufacturing proof force	Breaking force	Chain length
dn x p [mm]	dn x p [mm]	M2 / M3	M4	M5	FP [kN]	FB [kN]	[m]
3 x 9	2,8 x 8,4	140	130	120	7,1	11,3	100
4 x 12	3,7 x 11,1	260	230	210	12,6	20,1	100
5 x 15	4,7 x 14,1	400	360	320	19,6	31,4	100
5,6 x 17	5,2 x 15,6	500	450	400	24,6	39,4	100
6 x 18	5,6 x 16,8	580	520	460	28,3	45,2	100
6,3 x 19 (19,1)	5,9 x 17,7	640	570	510	31,2	49,9	100
7 x 21	6,6 x 19,8	780	710	630	38,5	61,6	100
7,1 x 20,2 (21)	6,6 x 19,8	810	730	650	39,6	63,3	100
7,9 x 23	7,4 x 22,2	1.000	900	800	49,0	78,4	100
8 x 24	7,4 x 22,2	1.050	920	820	50,3	80,4	100
9 x 27	8,4 x 25,2	1.300	1.150	1.050	63,6	102,0	100
9,5 x 28,6	8,8 x 26,4	1.450	1.300	1.150	70,9	113,0	100
10 x 30	9,3 x 27,9	1.600	1.450	1.300	78,5	126,0	100
11 x 33	10,2 x 30,6	1.950	1.750	1.550	95,0	152,0	100
11,1 x 33,3	10,3 x 30,9	1.950	1.800	1.600	96,8	155,0	100
11,2 x 34	10,4 x 31,2	2.000	1.800	1.600	98,5	158,0	100
12 x 36	11,2 x 33,6	2.300	2.100	1.850	113,0	181,0	100
12,5 x 38	11,6 x 34,8	2.500	2.250	2.000	123,0	196,0	100
12,7 x 36	11,8 x 35,4	2.600	2.350	2.050	127,0	203,0	100
13 x 39	12,1 x 36,3	2.700	2.450	2.150	133,0	212,0	100
14 x 42	13 x 39	3.150	2.850	2.500	154,0	246,0	50
16 x 48	14,9 x 44,7	4.100	3.700	3.300	201,0	322,0	50
18 x 54	16,7 x 50,1	5.200	4.650	4.150	254,0	407,0	50
20 x 60	18,6 x 55,8	6.400	5.750	5.150	314,0	503,0	50
22 x 66	20,5 x 61,5	7.750	7.000	6.200	380,0	608,0	50

#### Order example

100 m HE-chain WN G80 RD 9x27 gzn  
100 m HEP-chain WN G80 RD 9x27 gzn



## Stainless steel chains

### Mechanical and metallurgical properties for Round steel chain HE / Profile steel chain HEP



Stainless steel chains with quality grade G50K and G80K are suitable for chemical and food industry application, where corrosion must be avoided. Type G80K is available as a round steel chain (HE) as well as a profile steel chain (HEP).



Profile steel chain



Round steel chain

pewag Type	G80K	G50K
Type according to EN 818-7 und ISO 3077	DAT	P
Min. stress at proof force $\sigma_{FP}$ [N/mm <sup>2</sup> ]	500	315
Min. breaking stress $\sigma_{FB}$ [N/mm <sup>2</sup> ]	800	500
Min. breaking elongation A [%]	10	15
Min. surface hardness [HV]		
dn < 7 mm, HV 5	550	180
dn ≥ 7 mm, HV 10	550	180
Case hardening depth EHT [mm]		
dn < 8 mm	(0,04 +/-0,01) x dn	-
dn ≥ 8 mm	(0,04 +/-0,01) x dn	-
Duty rating group according to ISO 4301-1	M2 / M3 / M4 / M5	M1 / M2 / M3 / M4 / M5
Max. stress at working load limit $\sigma_F$ [N/mm <sup>2</sup> ]	160 / 160 / 140 / 125	125 / 100 / 100 / 90 / 80
Max. limit stress $\sigma_{Flim}$ [N/mm <sup>2</sup> ]	225 / 200 / 180 / 160	160 / 140 / 125 / 110 / 100
Material	Stainless Cr-alloyed steel	Stainless steel 1.4404 (SAE 316L) or 1.4571 (316Ti)
Lable on the shipping unit - shape/color		
Marking / stamping	H16 DAT-K	B16 P-K
Upper temperature limit [°C]	200	200
Lower temperature limit [°C]	-20	-

## Stainless steel chains

### Diameter-dependent properties

#### Type HEO-G50K

HEO-G50K type is made from a rust-proof austenitic Cr-Ni

special steel 1.4571 (SAE 316 Ti) or 1.4404 (SAE 316L).

This steel is non-magnetic and excellent chemical resistant to acids, alkalis and chlorides.

pewag Type	HEO-G50K (Round steel chains)						
Type according to EN 818-1	P						
Nominal dia. x pitch Round steel chain	Capacity according to duty rating group ISO 4301-1 [kg]				Manufacturing proof force	Breaking force	Chain length
dn x p [mm]	M1	M2 / M3	M4	M5	FP [kN]	FB [kN]	[m]
3 x 9	180	140	130	120	4,5	7,1	100
4 x 12	320	260	230	210	7,9	12,6	100
5 x 15	500	400	360	320	12,4	19,6	100
5,6 x 17	630	500	450	400	15,5	24,6	100
6 x 18	720	580	520	460	17,8	28,3	100
6,3 x 19 (19,1)	790	640	570	510	19,6	31,2	100
7 x 21	1.000	780	710	630	24,2	38,5	100
7,1 x 20,2 (21)	1.000	810	730	650	24,9	39,6	100
7,9 x 23	1.250	1.000	900	800	30,9	49,0	100
8 x 24	1.300	1.050	920	820	31,7	50,3	100
9 x 27	1.600	1.300	1.150	1.050	40,1	63,6	100
9,5 x 28,6	1.800	1.450	1.300	1.150	44,7	70,9	100
10 x 30	2.000	1.600	1.450	1.300	49,5	78,5	100
11 x 33	2.400	1.950	1.750	1.550	59,9	95,0	100
11,1 x 33,3	2.450	1.950	1.800	1.600	61,0	96,8	100
11,2 x 34	2.500	2.000	1.800	1.600	62,1	98,5	100
12 x 36	2.900	2.300	2.100	1.850	71,3	113,0	100
12,5 x 38	3.150	2.500	2.250	2.000	77,3	123,0	100
12,7 x 36	3.250	2.600	2.350	2.050	79,8	127,0	100
13 x 39	3.400	2.700	2.450	2.150	83,6	133,0	100
14 x 42	3.900	3.150	2.850	2.500	97,0	154,0	50
16 x 48	5.150	4.100	3.700	3.300	127,0	201,0	50

#### Order example

100 m Stainless chains HEO-chain WN G50K 5x15 bk

## Stainless chains

### Diameter-dependent properties

#### Type HE-G80K

Stainless steel chain with quality grade 80. This means unlike common austenitic stainless steel chains, the working load limit of the hoist needs not to be reduced.

By using a new case hardening technology, with nitrogen, the chain provides a high surface hardness, wear resistance and corrosion resistance. The corrosion resistance of stainless Cr-steel even has been improved by this new heat treatment technology.

This type of chain is available as a round steel chain (HE) and as a profile steel chain (HEP).

pewag Type		HE-, HEP-G80K					
Type according to EN 818-7 and ISO 3077		DAT					
Nominal dia. x pitch Round steel chain	Nominal dia. x pitch Profile steel chain	Capacity according to duty rating group ISO 4301-1 [kg]			Manufacturing proof force	Breaking force	Chain length
dn x p [mm]	dn x p [mm]	M2 / M3	M4	M5	FP [kN]	FB [kN]	[m]
3 x 9	2,8 x 8,4	230	200	180	7,1	11,3	100
4 x 12	3,7 x 11,1	410	360	320	12,6	20,1	100
5 x 15	4,7 x 14,1	640	560	500	19,6	31,4	100
5,6 x 17	5,2 x 15,6	800	700	630	24,6	39,4	100
6 x 18	5,6 x 16,8	920	810	720	28,3	45,2	100
6,3 x 19 (19,1)	5,9 x 17,7	1.000	890	790	31,2	49,9	100
7 x 21	6,6 x 19,8	1.250	1.100	1.000	38,5	61,6	100
7,1 x 20,2 (21)	6,6 x 19,8	1.300	1.150	1.000	39,6	63,3	100
7,9 x 23	7,4 x 22,2	1.600	1.400	1.250	49,0	78,4	100
8 x 24	7,4 x 22,2	1.650	1.450	1.300	50,3	80,4	100
9 x 27	8,4 x 25,2	2.100	1.800	1.600	63,6	102,0	100
9,5 x 28,6	8,8 x 26,4	2.300	2.000	1.800	70,9	113,0	100
10 x 30	9,3 x 27,9	2.550	2.250	2.000	78,5	126,0	100
11 x 33	10,2 x 30,6	3.100	2.700	2.400	95,0	152,0	100
11,1 x 33,3	10,3 x 30,9	3.150	2.750	2.450	96,8	155,0	100
11,2 x 34	10,4 x 31,2	3.200	2.800	2.500	98,5	158,0	100

#### Order example

100 m Stainless steel chains HE-chain WN G80K 6,3x19,1

100 m Stainless steel chains HEP-chain WN G80K 7x21

## Through hardened chains

### Mechanical and metallurgical properties for Round steel chain HEO / Profile steel chain HEO-P



Through hardened hoist chains with higher surface hardness than demanded, in EN 818-7 and ISO 3077 standard, available in G80 and G100 quality, for use in manual hoists. Available as a round steel chain, HEO type, and a profile steel chain, HEO-P type.



Profile steel chain



Round steel chain

pewag Type	G80	G100
Type according to EN 818-7 und ISO 3077	T	V
Min. stress at proof force $\sigma_{FP}$ [N/mm <sup>2</sup> ]	500	630
Min. breaking stress $\sigma_{FB}$ [N/mm <sup>2</sup> ]	800	1.000
Min. breaking elongation A [%]	10	15
Min. surface hardness [HV]		
dn < 7 mm, HV 5	380	420
dn ≥ 7 mm, HV 10	380	420
Duty rating group according to ISO 4301-1	M1 / M2 / M3 / M4 / M5	M1 / M2 / M3 / M4 / M5
Max. stress at working load limit $\sigma_F$ [N/mm <sup>2</sup> ]	200 / 160 / 160 / 140 / 125	250 / 160 / 160 / 140 / 125
Max. limit stress $\sigma_{Flim}$ [N/mm <sup>2</sup> ]	225 / 200 / 180 / 160	225 / 200 / 180 / 160
Material	Cr-Ni-Mo alloyed chain steel according EN 818-7 and ISO 3077	Cr-Ni-Mo alloyed chain steel according EN 818-7 and ISO 3077
Label on the shipping unit - shape/color		
Marking / stamping	H16 T	B16 VH
Upper temperature limit [°C]	200	200
Lower temperature limit [°C]	-40	-40



## Through hardened chains

### Diameter-dependent properties

#### Type G80

Through hardened chain with 380 HV minimum surface hardness and 10% minimum breaking elongation. Compared to the requirements of EN 818-7 and IOS 3077, the surface hardness is 20 HV higher, which, in turn, ensures better wear resistance.

pewag Type		G80				
Type according to EN 818-7 and ISO 3077		T				
Nominal dia. x pitch Round steel chain	Nominal dia. x pitch Profile steel chain	Capacity according to duty rating group ISO 4301-1 [kg]		Manufacturing proof force	Breaking force	Chain length
dn x p [mm]	dn x p [mm]	M1 (manual.)	M2 / M3 (motor.)	FP [kN]	FB [kN]	[m]
3 x 9	2,8 x 8,4	290	230	7,1	11,3	100
4 x 12	3,7 x 11,1	510	410	12,6	20,1	100
5 x 15	4,7 x 14,1	800	640	19,6	31,4	100
5,6 x 17	5,2 x 15,6	1.000	800	24,6	39,4	100
6 x 18	5,6 x 16,8	1.150	920	28,3	45,2	100
6,3 x 19 (19,1)	5,9 x 17,7	1.250	1.000	31,2	49,9	100
7 x 21	6,6 x 19,8	1.550	1.250	38,5	61,6	100
7,1 x 20,2 (21)	6,6 x 19,8	1.600	1.300	39,6	63,3	100
7,9 x 23	7,4 x 22,2	2.000	1.600	49,0	78,4	100
8 x 24	7,4 x 22,2	2.050	1.650	50,3	80,4	100
9 x 27	8,4 x 25,2	2.600	2.100	63,6	102,0	100
9,5 x 28,6	8,8 x 26,4	2.900	2.300	70,9	113,0	100
10 x 30	9,3 x 27,9	3.200	2.550	78,5	126,0	100
11 x 33	10,2 x 30,6	3.900	3.100	95,0	152,0	100
11,1 x 33,3	10,3 x 30,9	3.950	3.150	96,8	155,0	100
11,2 x 34	10,4 x 31,2	4.000	3.200	98,5	158,0	100
12 x 36	11,2 x 33,6	4.600	3.700	113,0	181,0	100
12,5 x 38	11,6 x 34,8	5.000	4.000	123,0	196,0	100
12,7 x 36	11,8 x 35,4	5.150	4.150	127,0	203,0	100
13 x 39	12,1 x 36,3	5.400	4.350	133,0	212,0	100
14 x 42	13 x 39	6.300	5.000	154,0	246,0	50
16 x 48	14,9 x 44,7	8.200	6.550	201,0	322,0	50
18 x 54	16,7 x 50,1	10.400	8.300	254,0	407,0	50
20 x 60	18,6 x 55,8	12.800	10.300	314,0	503,0	50
22 x 66	20,5 x 61,5	15.500	12.500	380,0	608,0	50

#### Order example

100m HEO-chain WN G80 9x27 gzn

100m HEO-P-chain WN G80 9x27 gzn

## Through hardened chains

### Diameter-dependent properties

#### Type G100

Through-hardened chain with 420 HV minimum surface hardness and 10% minimum breaking elongation for higher wear resistance and working load limit according to G100.

pewag Type		G100				
Type according to EN 818-7 and ISO 3077		V				
Nominal dia. x pitch Round steel chain	Nominal dia. x pitch Profile steel chain	Capacity according to duty rating group ISO 4301-1 [kg]		Manufacturing proof force	Breaking force	Chain length
dn x p [mm]	dn x p [mm]	M1 (manual.)	M2 / M3 (motor.)	FP [kN]	FB [kN]	[m]
3 x 9	2,8 x 8,4	360	230	8,9	14,1	100
4 x 12	3,7 x 11,1	640	410	15,8	25,1	100
5 x 15	4,7 x 14,1	1.000	640	24,7	39,3	100
5,6 x 17	5,2 x 15,6	1.260	800	31,0	49,3	100
6 x 18	5,6 x 16,8	1.440	920	35,6	56,5	100
6,3 x 19 (19,1)	5,9 x 17,7	1.590	1.000	39,3	62,3	100
7 x 21	6,6 x 19,8	1.960	1.250	48,5	77,0	100
7,1 x 20,2 (21)	6,6 x 19,8	2.020	1.300	49,9	79,2	100
7,9 x 23	7,4 x 22,2	2.500	1.600	61,8	98,0	100
8 x 24	7,4 x 22,2	2.560	1.650	63,3	101,0	100
9 x 27	8,4 x 25,2	3.240	2.100	80,2	127,0	100
9,5 x 28,6	8,8 x 26,4	3.610	2.300	89,3	142,0	100
10 x 30	9,3 x 27,9	4.000	2.550	99,0	157,0	100
11 x 33	10,2 x 30,6	4.850	3.100	120,0	190,0	100
11,1 x 33,3	10,3 x 30,9	4.930	3.150	122,0	194,0	100
11,2 x 34	10,4 x 31,2	5.020	3.200	124,0	197,0	100
12 x 36	11,2 x 33,6	5.770	3.700	143,0	226,0	100
12,5 x 38	11,6 x 34,8	6.260	4.000	155,0	245,0	100
12,7 x 36	11,8 x 35,4	6.460	4.150	160,0	253,0	100
13 x 39	12,1 x 36,3	6.770	4.350	167,0	265,0	100
14 x 42	13 x 39	7.850	5.000	194,0	308,0	50
16 x 48	14,9 x 44,7	10.300	6.550	253,0	402,0	50
18 x 54	16,7 x 50,1	13.000	8.300	321,0	509,0	50
20 x 60	18,6 x 55,8	16.000	10.300	396,0	628,0	50
22 x 66	20,5 x 61,5	19.400	12.500	479,0	760,0	50

#### Order example

100m HEO-chain WN G100 9x27 bf  
100m HEO-P-chain WN G100 10x30 bf

pewag high strength hoist chains are stamped with the approval stamp of the German professional association and with a five-digit batch number.





# pewag hoist chains

## Finishing

### Content

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# Surface finishing

**pewag offers a variety of surface finishing, manufactured to customer specification.**

## Electro galvanized

Electro galvanized chains are very well protected against corrosion through its zinc coating. This offers a cathodic protection effect for the basic material too. By a suitable after-treatment in a chromating bath the zinc coating is protected with a chromate coat. So the whole corrosion protection is improved. pewag hoist chains are electro galvanized in a continuous-working-electro-galvanizing-plant. The surface finish is available blue or yellow chromated. The chromates are free of Cr-VI. (hexa valent Cr.)



Galvanized blue



Galvanized yellow

## Black Finish

A cost-saving protection method against corrosion. The blackening and the corrosion protection results from dipping the chain into a burnishing oil emulsion.



Black finish

## Bright polished

This method is used for rust-proof chains. The surface finishing is carried out in a tumbling barrel. This kind of finishing is suitable especially for stainless steel chain.



Bright polished

## Chemical nickel

Chemical nickel is a nickel-phosphor corrosion protection coating on the chain. The corrosion protection is due to the high corrosion resistance of nickel. Furthermore the chemical-nickel-method offers an improvement of the wear resistance based on the high intrinsic hardness of the coating.



Chemical nickel

# Types of packaging

pewag offers a large number of standardized packaging options, which makes the storage and transport of high-strength chains easy.

- Plastic barrels (especially overseas)
- Plastic pails
- Steel drums
- Pallet boxes



Plastic barrels



Plastic pails



Steel drums



Pallet boxes



# pewag hoist chains

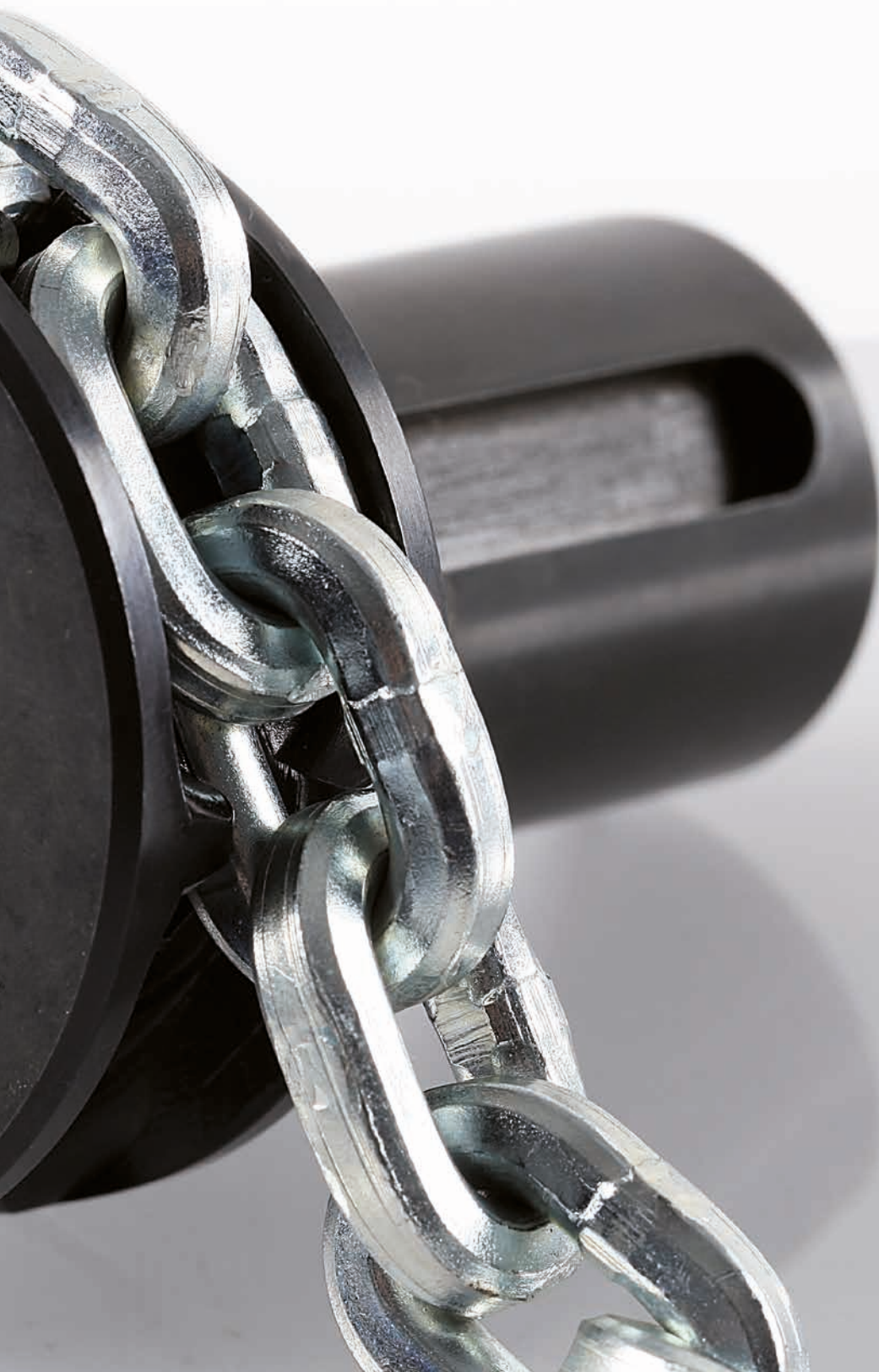
## Chain drives

### Content

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# Chain wheel design

**We support our customers with the dimensioning of the sprocket and the chain guide. We can deliver the sprockets and chain guides in machined and hardened version on request.**

Pocket wheels can be produced basically without support of the vertical chain links (Type TR, KR) or with support of the vertical chain links (Type TRP, KRP). For use with profile chains HEP or HEO-P the version with support of the vertical chain links is necessary.

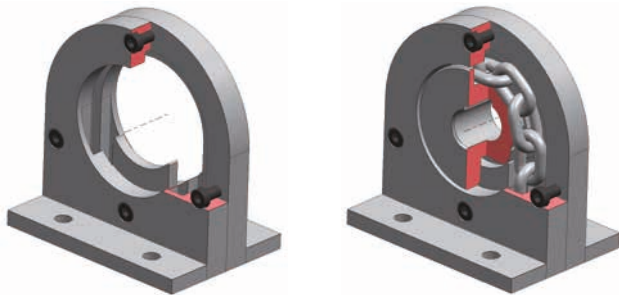
## Chain wheels and chain guides for hoist chains

- machined-finished with perfect fit for the chain
- case-hardened for chains HE and HEP
- through-hardened for chains HEO and HEO-P
- surface hardness adjusted to that of the chain

## Standard version of chain guides

Hoist chain drives must be equipped with a chain guide which ensures that the chain is fed untwisted into the wheel, avoids the chain jumping off the wheel and ensures, that the chain is stripped off the wheel smoothly under full load.

The chain has to be lubricated with a suitable chain-oil. There must remain a continuous interlink oil film during operation, in order to achieve the expected chain life time.



Description for chain guide: KF dn / z - pn of the selected chain ...

### Order example

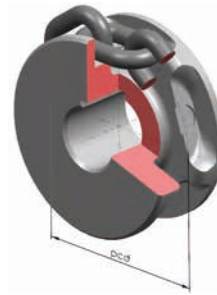
KF 5/6-15 for HE-chain WN G80 RAS 5x15

## Standard version of chain wheels

### Type TR pocket wheel

These wheels can be used with case hardened and through hardened round steel chains. To ensure a smooth interaction between chain and pocket wheel the wheel has to be adapted exactly to the chain dimensions.

When using a pewag hoist chain we are pleased to offer you the construction of an optimal sprocket.



TR Round steel chain

### Order example

10 pcs. pocket wheels „TR 9/5-27“ for HE-chain WN G80 RAS 9x27, Hubtype A, drilling diameter d = 35 mm with Keyway.

### Type TRP pocket wheel

These wheels can be used with case hardened and through hardened round steel chains. At these wheels also the vertical chain links are supported. That allows a better load sharing. To ensure a smooth interaction between chain and pocket wheel, the wheel has to be adapted exactly to the chain dimensions. When using a pewag hoist chain, we are pleased to offer you the construction of an optimal sprocket.



TRP Round steel chain



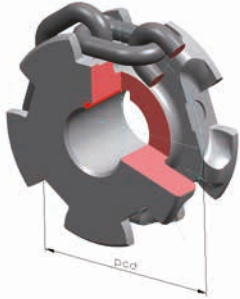
TRP Profile steel chain

### Order example

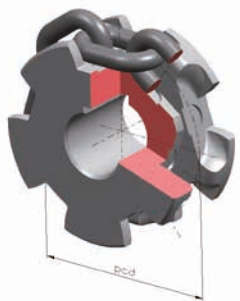
10 pcs. pocket wheels „TRP 5/5-15“ for HEP-chain WN G80 RAS 5x15.

### Type KR chain wheel

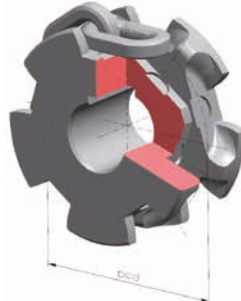
Compared to other pocket wheels the advantage of KR pocket wheels is that conveyed material or dirt can fall out of the side openings. Pocket wheels KR can be produced with or without support of the vertical chain links.



KR Round steel chain



KRP Round steel chain



KRP Profile steel chain

### Order example

10 pcs. chain wheels „KRP 5/6-15“ for HEO-chain WN G100 5x15, Hubtype B, drilling diameter  $d = 25$  mm without Keyway.

### Type TR: Standard version

**Type KR:** For operation in dirty environments. The dirt can fall out between the tooth exemptions.

**Type TRP, KRP:** With interior polygone for high chain loads. The vertical chain link in the chain wheel series is supported additionally.

### Designation

TR (KR, TRP, KRP)  $d_n / z - p$  for chaintype ...

$d_n$  = chain wheel diameter

$z$  = No. of pockets

$p$  = chain pitch

Pitch circle diameter,  $pcd \sim 2x z x p / \pi$

Maximum drilling  $d = pcd - 5,4 x d_n$

Minimum-width  $b = 4,4 x d_n$  (for TR u. TRP)

Minimum-width  $b = 3,4 x d_n$  (for KR u. KRP)

Shoulders diameter  $a = 1,8 x d$

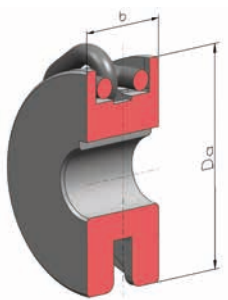
Hublength  $e = b + d_n$

Please indicate the desired dimensions of bore and hub!

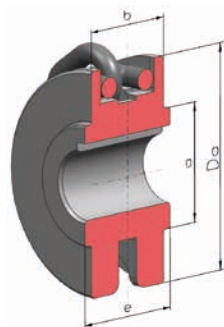
If no dimensions are indicated, standard hub design A and maximum bore size with the keyway will be delivered.

For profile steel chains HEP and HEO-P, design TRP od KRP (with internal polygone) is compulsory.

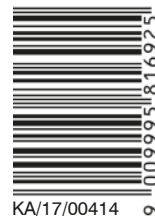
## Hub type



Type A: plain



Type B: with shoulders



www.pewag.com

**pewag austria GmbH**

A-8041 Graz, Gaslaternenweg 4, Phone: +43 50 50 11-0, Fax: +43 50 50 11-100,  
saleinfo@pewag.com, [www.pewag.com](http://www.pewag.com)

