pewag

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.

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:

Because of our joy and determination to innovate, we at pewag group strive to manufacture the world's best products wherever we compete – today and in the future. The high quality of our products and services, as well as the passionate performance of our employees are our biggest assets to reach excellence and total customer satisfaction.

Principles of pewag group

Leading in Quality

The values of our premium 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 the best value for the money; 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 workstyle, 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 leadership through highest product quality, constant improvements and innovations of products, as well as manufacturing processes.

We are dedicated to keep on top of product technology. This ensures that our customers always have the best 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 15th century and therefore makes us 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 snow chain in the world
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.

Lithography forging plant Brückl 1855

Anchor chain forge 1878

Chain forgers 1956

Quality management

Our ultimate goal is to achieve customer satisfaction

To reach this goal, the quality management of the pewag group is determined by the principle: "We supply our customers with high-quality products which fully meet technological standards and its usage requirements," this is summarized in the four following mandatory principles:

Market oriented quality
To maintain and improve its competitive position, the quality of products and services of the pewag group must meet both the specifications of our customers and the standards one can expect from the technological leader in the industry.

Economic quality
As a profit-oriented company, the quality is also determined by the material used, labour costs and financial possibilities, i.e. also within the framework awarded by the customer.

Responsibility for Quality
Quality management is the task and obligation of executives at all levels. Every employee of the pewag group has to be integrated by management in the preparations, execution and evaluation of the quality management measures.

Every employee takes the responsibility for the quality of his work.

Process oriented quality assurance
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.

AUSTRIA

ISO 14001 TÜV SÜD ISO 9001

Business areas

Working with pewag products

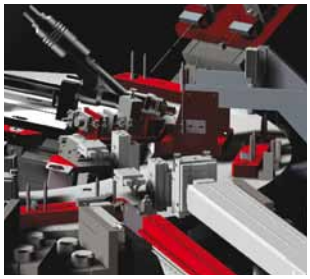
The pewag group has a substantial and diverse spectrum of products and services.

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

We continuously strive to keep the influence of our business on the environment as low as possible. Our production and warehousing is organized so that all legal requirements on environmental protection are fulfilled. Furthermore, we consider ecological aspects for our product development, processes and distribution channels and include these in our business planning.

Consequently, we are permanently striving for a continuous improvement and development of our established products to reach higher load capacities and safety for our customers with lighter weights and longer life spans.

Wherever we cannot avoid an environmental impact, we strive to reduce the use of energy, environmentally harmful emissions and keep the production of waste to a minimum. When investing in new machines, we consider the technically most adequate and economically feasible state-of-the-art designs for their designated area of use.

Our environmental management is certified according to ISO 14001:2004. Regular internal audits assist to supervise compliance, test the effectiveness of our set standards and serve as a basis to determine improvement potentials.

Out of this long-lasting tradition, we take responsibility for our products, employees, our sites and the environment very seriously.

We commit to comply with all environment-related regulations and continually improve our performance for the environment by defined goals. For that purpose, we use modern production technologies. We enhance the ecological awareness of our employees by regular trainings.

We engage with our customers, neighbours and government agen-cies in an open communication and inform them about our environmental management wherever appropriate.

By providing advice, we want to inform our customers about the environmental aspects related to the use of our products – especially their long life spans. We are striving to motivate our customers and suppliers to consider environmental protection in their sphere of influence and use the same environmental standards as we do.

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 8 production and 26 sales and other locations on the continents of Europe, America and Africa pewag documented its claim as the world's number one chain manufacturer.

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 AMW Grünberger Handelsgesellschaft mbH, Wien pewag Ketten GmbH, Klagenfurt pewag International GmbH, Klagenfurt
Germany	pewag Deutschland GmbH, Unna pewag Schneeketten Deutschland GmbH, Unna
France	J3C SAS pewag France, Seyssins Chaineries Limousines SAS, Bellac Chaineries Limousines SAS, Limoges
Italy	pewag italia srl, Andrian
Nederland	pewag nederland BV, Hillegom APEX International BV, Hillegom Interparts Industrie Mij BV, Hillegom

Europe	
Poland	pewag polska Sp. z o.o., Buczkowice
Russia	OOO „PEWAG", Moscow OOO „pewag russia", Moscow
Sweden	pewag sweden AB, Emmaboda
Slowakia	pewag slovakia sro, Nitra
Czechia	Řetězárna Česká Třebová sro, Česká Třebová pewag sro, Vamberk
Ukraine	TOV pewag Ukraine, Lviv

North America	
USA	pewag Inc, Bolingbrook, Illinois pewag Inc, Rocklin, California

Africa	
South Africa	HMV Engineering (Pty) Ltd, Houghton Johannesburg

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itself on the internet. More ...
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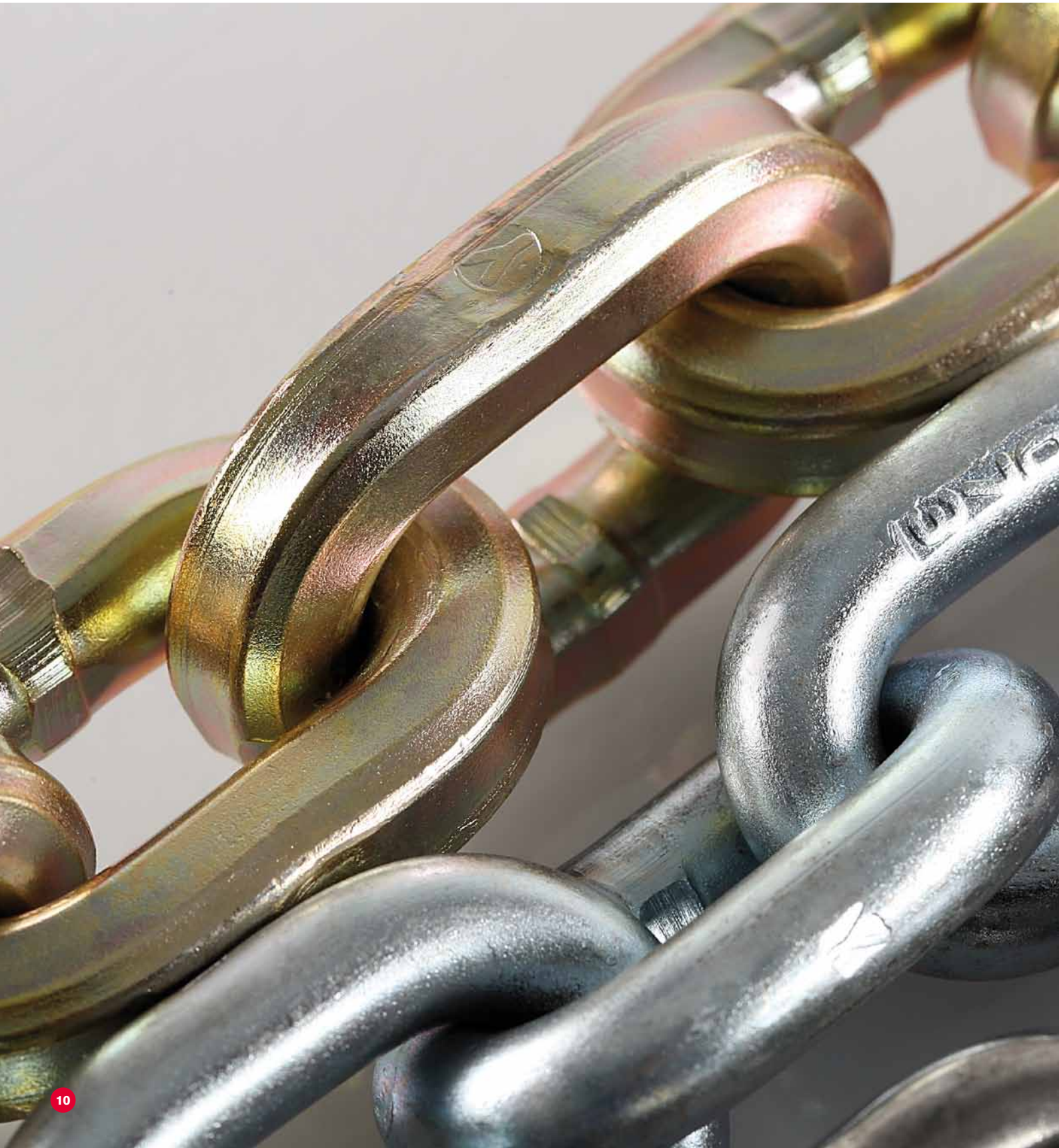
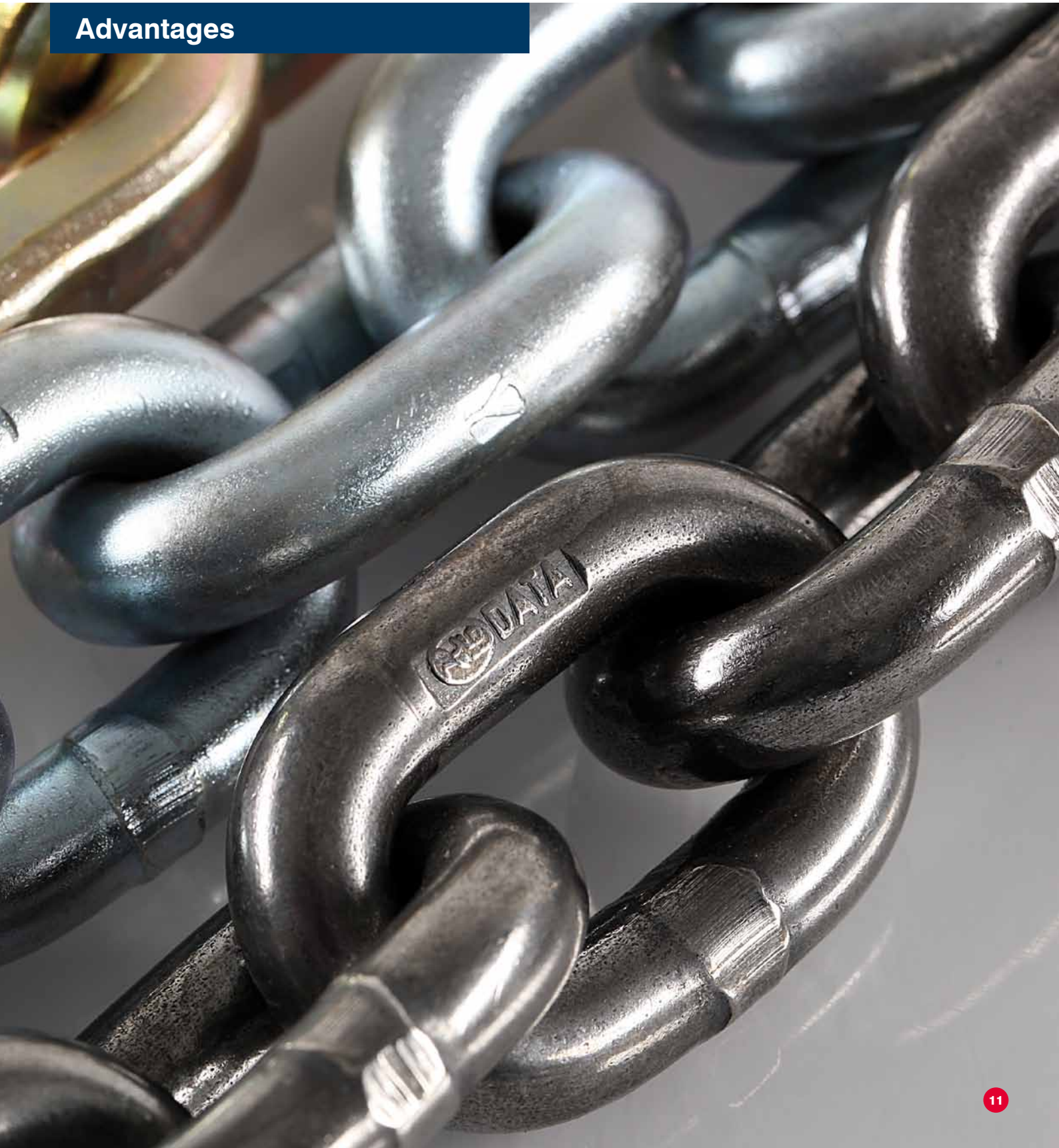


pewag hoist chains

Advantages

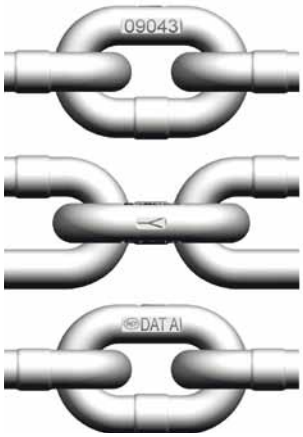


Advantages of pewag hoist chains

- 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 continous 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 continous 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

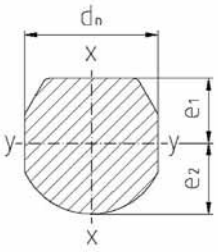
Profile steel chain

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

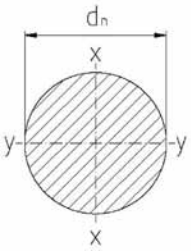
- 7% smaller chain diameter compared to round steel chains with same cross section areas. This enables a smaller chain drive and finally a smaller hoist.
- Increased bending resistance of the intelligent profile section provides a higher fatigue resistance and higher safety factor against fatigue breakages.
- 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

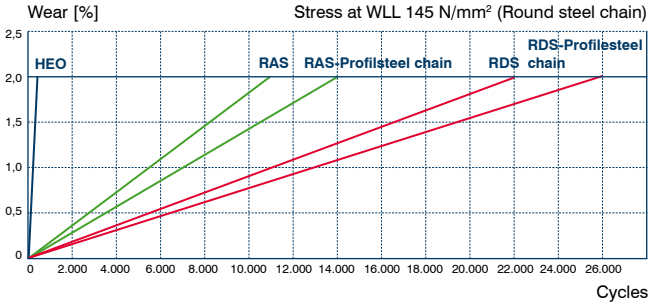
Data depending on cross section	Advantages profile chain	Profile steel chain	Round steel chain
Nominal diameter	-7%	d=11 mm	d=11,8 mm
Chain cross-section	+/- %	A=109,8 mm²	A=109,8 mm²
Bending section-module	+6,5%	W_x=172,9 mm³	W_{xy}=162,3 mm³
	+13,3%	W_{y1}=183,9 mm³	W_{xy}=162,3 mm³
	+1,7%	W_{y2}=165,1 mm³	W_{xy}=162,3 mm³

Profile steel chain vs. Round steel chain

Wear values

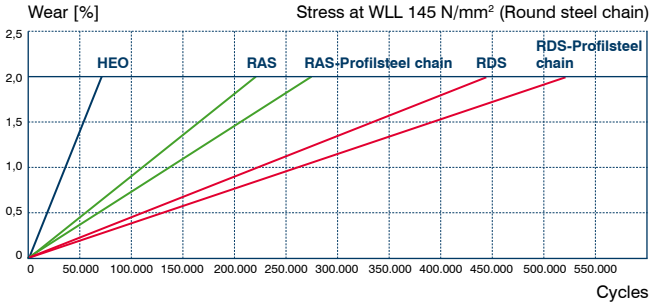
The values have been determined on the pewag test rig for dry and lubricated chains in one-strand-operation.

Dry running condition



Wear test, dry chain

Lubricated with motor oil



Wear test, chain lubricated

Duty rating groups

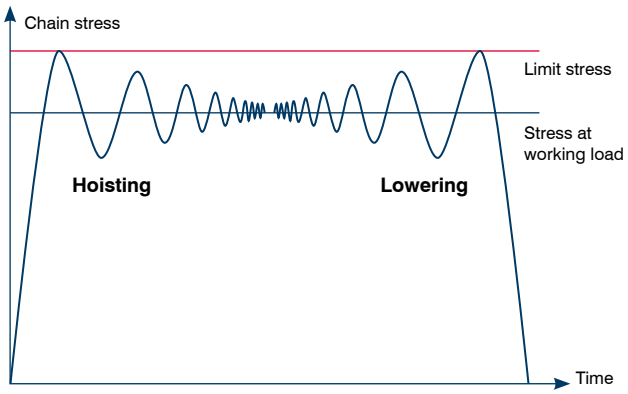
Depending on the intended usage, hoists are rated in duty rating groups according to ISO 4301-1. The duty rating group indicades the permissible working time and permissible utilization of the hoist equipment at full or partial load. Depending on the duty rating group, the safety factor of the chain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

Duty rating group according to IS0 4301-1

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

Permissible limit stress

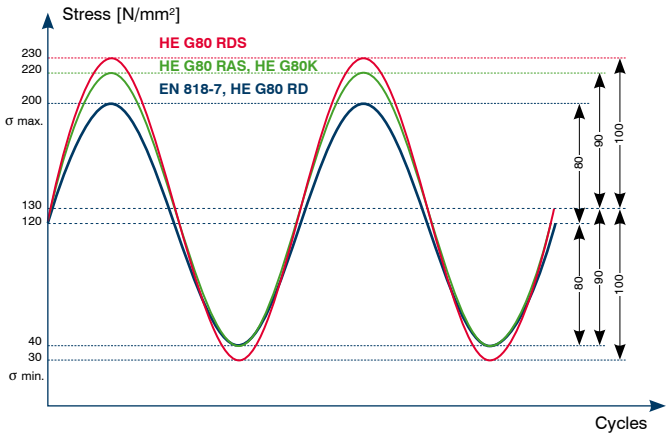
During hoist operations, it must be ensured that the maximum limit stress of the chain according to EN 818-7 and ISO 3077 is not exceeded. As chains run over the wheels oscillating forces are generated, which load the chain above the working load (polygone effect of the chain wheel, acceleration-, breaking 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/mm² and a minimum stress of 40 N/mm² for more than 2 million cycles. pewag does subject the chains to a standard test at a higher maximum stresses of 220 N/mm² and 230 N/mm².



pewag hoist chains

Types of chains

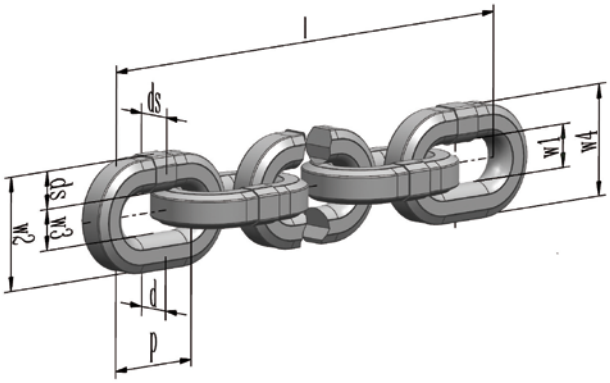
Chain dimensions according to EN 818-7

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.

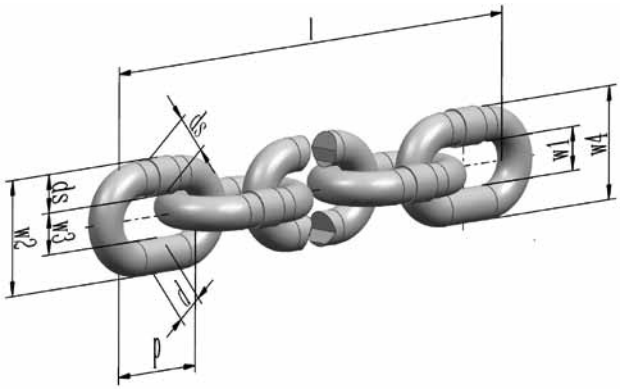
Profile steel chain

Round steel chain

Nominal dia		Pitch		Width		Multiple Pitch		Weld dia	Weight
d	Tolerance	p	Tolerance	inner w3-min.	outher 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

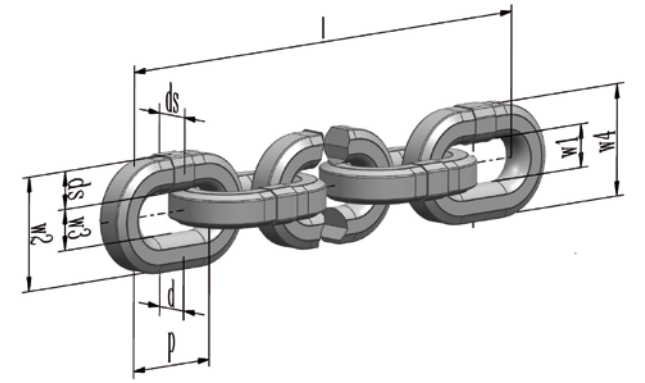
Chain dimensions according to JIS B8812

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.

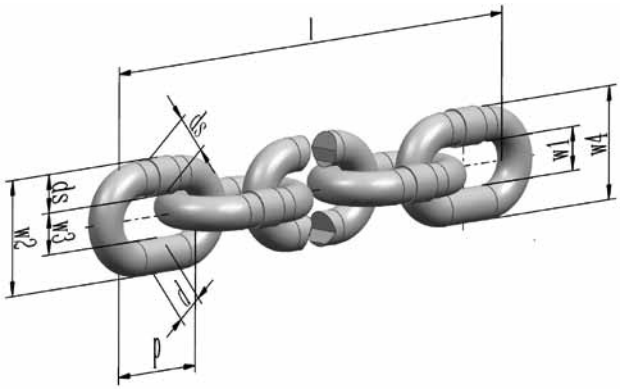
Profile steel chain

Round steel chain

Nominal dia		Pitch		Width		Width beside the weld		Multiple Pitch		Weld dia	Weight
d	Tolerance	p	Tolerance	inner w3-min.	outher w2-max.	inner w1-min.	outher 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	18,0	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 accoding to EN 818-7 und ISO 3077	DAT	DAT	DT
Min. stress at proof force σ_{FP} [N/mm²]	500	500	500
Min. breaking stress σ_{FB} [N/mm²]	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 σ_F [N/mm²]	160 / 160 / 140 / 125	160 / 160 / 140 / 125	100 / 100 / 90 / 80
Max. limit stress σ_{Flim} [N/mm²]	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		
Lable 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 exceed 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, hydralic) 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 accoding to EN 818-7 und ISO 3077	DAT	P
Min. stress at proof force σ_{FP} [N/mm²]	500	315
Min. breaking stress σ_{FB} [N/mm²]	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 σ_F [N/mm²]	160 / 160 / 140 / 125	125 / 100 / 100 / 90 / 80
Max. limit stress σ_{Flim} [N/mm²]	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 accoding to EN 818-7 und ISO 3077	T	V
Min. stress at proof force σ_{FP} [N/mm²]	500	630
Min. breaking stress σ_{FB} [N/mm²]	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 σ_F [N/mm²]	200 / 160 / 160 / 140 / 125	250 / 160 / 160 / 140 / 125
Max. limit stress σ_{Flim} [N/mm²]	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
Lable 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.

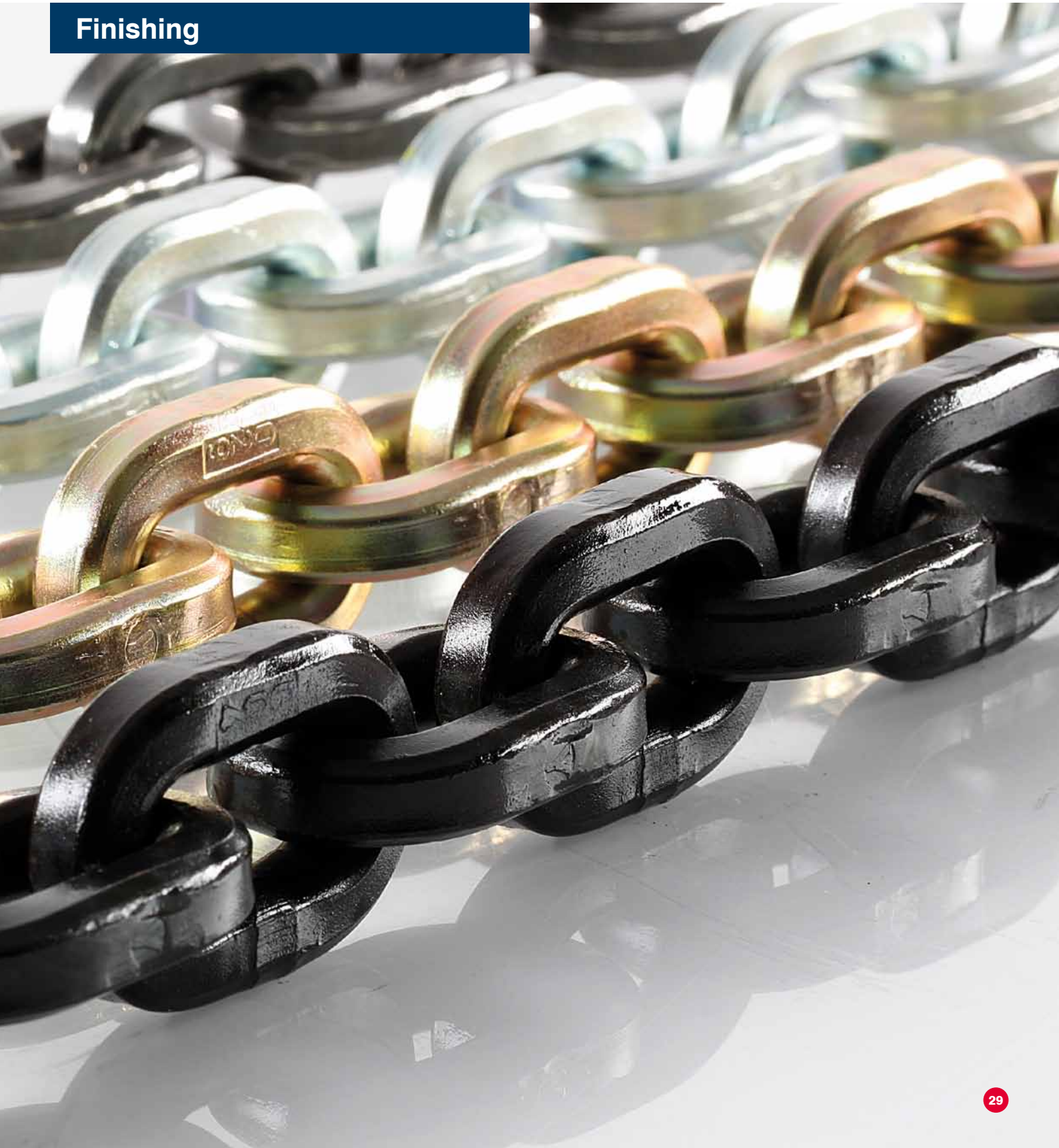
pewag Type		G100				
Type according to EN 818-7 and ISO 3077		V				
Nominal dia. x pitch Round steel chain	Nominal dia. x pitch Profile steel chain	Capacity according to duty rating group ISO 4301-1 [kg]		Manufacturing proof force	Breaking force	Chain length
dn x p [mm]	dn x p [mm]	M1 (manual.)	M2 / 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



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 continous-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

Chain wheel design

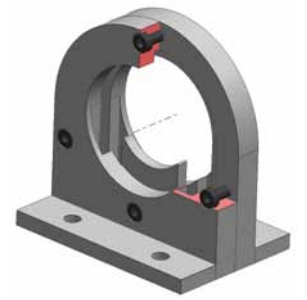
We support our customers with the dimensioning of the sprocket and the chain guide. We can deliver the sprockets and chain guides in machined and hardened version on request.
Pocket wheels can be produced basically without support of the vertical chain links (Type TR, KR) or with support of the vertical 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 hardeness 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 continous interlink oil film during operation, in order to achieve the expected chain life time.

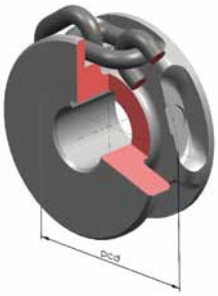


Description for chain guide: KF dn / z - pn of the selected chain ...

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

Standard version of chain wheels

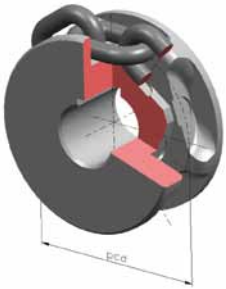
Type TR pocket wheel
These wheels can be used with case hardened and through hardened round steel chains. To ensure a smooth interaction between chain and pocket wheel the wheel has to be adapted exactly to the chain dimensions.
When using a pewag hoist chain we are pleased to offer you the construction of an optimal sprocket.



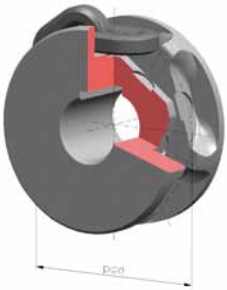
TR Round steel chain

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.



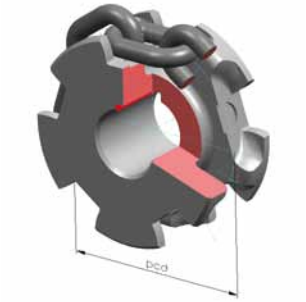
TRP Round steel chain



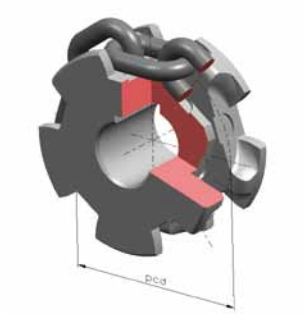
TRP Profile steel chain

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

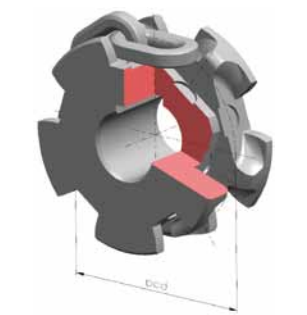
Type KR chain wheel
Compared to other pocket wheels the advantage of KR pocket wheels is that conveyed material or dirt can fall out of the side openings. Pocket wheels KR can be produced with or without support of the vertical chain links.



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

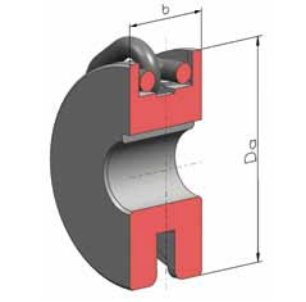
Type KR: For operation in dirty environments. The dirt can fall out between the tooth exemptions.

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

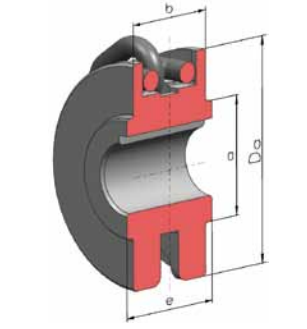
Designation
TR (KR, TRP, KRP) dn / z - p for chaintype ...
dn = chain wheel diameter
z = No. of pockets
p = chain pitch
Pitch circle diameter, pcd ~ 2x z x p / TT
Maximum drilling d = pcd - 5,4 x dn
Minimum-width b = 4,4 x dn (for TR u. TRP)
Minimum-width b = 3,4 x dn (for KR u. KRP)
Shoulders diameter a = 1,8 x d
Hublength e = b + dn

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

KA/12/00125 9 002546 941466

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