FIRE SPECIAL SLING CHAINS

LiftingPlus
Hijsen met visie

Samen voor kwaliteit!

van den Berg Bros
Takeltechniek

Sling chains

Advantages and Information

Advantages for hot galvanising plants

Galvanizing plants use various types of sling chains for lifting and transporting parts to be galvanized and for adding zinc-ingots.
Chains, particularly those used during the galvanizing process, are subject to extraordinarily high stress:

- They are heated up to approx. 475°C in the galvanizing bath.
- They are subjected to zinc corrosion.
- The hydrogen that develops during the repeated work cycles of „galvanizing – pickling – galvanizing“ in the galvanizing bath has a considerable effect on the chains.

pewag winner fire

The absorption of hydrogen causes the dreaded stress corrosion cracking which results in component breakage without any signs of deformation or any other previous warning signals. In the case of sling chains, such failure would have dramatic consequences.

With pewag's special sling chains for hot galvanizing plants you have this problem under control!

This has been proven in renowned European galvanizing plants for several years. (In Germany, pewag austria was the first and only chain manufacturer to receive a special permit from the German trade association which was later replaced by EN 818.) In galvanizing plants, the chains are used in diluted sulfuric or hydrochloric acid of a concentration of 15% at approx. 20-30°C bath temperature.

The use of pewag chains offers further important advantages compared to ordinary chains of grade 2 acc. to BGR 150:

- Due to the higher strength (quality grade 4 according to EN 818-5), the ratio of load capacity and mass is improved by a factor of 2.6.
- The surface of the chains and thus the undesired zinc drag-out is reduced by nearly 30%.
- At high temperatures, pewag's special sling chains for hot galvanizing plants achieve a 25% higher minimum breaking force than those demanded in EN 818-5 and EN 818-6, which means 25% more safety for the user. The risk of breaking is significantly smaller than with ordinary chains and the level of security 25% higher.

Production

All pewag winner fire sling chains are produced in all welded design pursuant to EN 818-5 and afterwards subjected to a special treatment to increase the resistance to stress corrosion cracking. pewag winner fire chain slings must not be modified by the user.

Test certificate

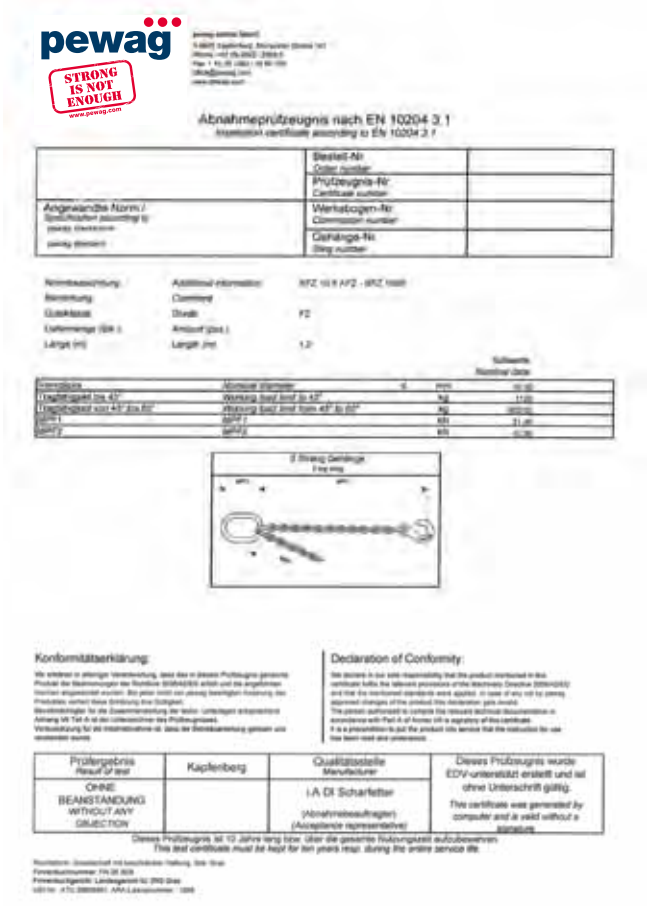
Test certificates are issued for each sling chain and must be kept on file for the entire period of usage.

Impermissible chain slings in hot galvanizing plants

Following chain slings must not be used in galvanizing plants:

- All chains which are not designed for lifting purposes. That is, all long link chains whose pitchs (inside link length) are 3 times longer than the link diameter.
- All chains which are built according to the “modular principle”. In such cases, the acid settles in the assembly joints and causes invisible and undetectable damages. For this reason, it is irrelevant if the chain was mounted by the producer himself or by another expert.
- All chains whose grades exceed grade 4 (e.g., chains in grade 8 or 10). The materials used in the chains embrittle in case of the slightest hydrogen absorption and break like glass without prior indication
- All chains whose ID-tags are missing
- All damaged chains (please also see BRG 150, EN-818-6 and our user manual on page 24)

Tragkraftanhänger



Prüfzeugnis

Possibilities of combination

pewag winner fire system offers many possibilities of combination. Our chain slings are produced according to the information provided by the user. Special constructions are also possible. Welding processes are carried out according to BG directives. The original product must not be altered or modified after shipment. If needed, we also provide customized solutions on site.

Examples of use

Typical chain applications in hot dip galvanizing plants

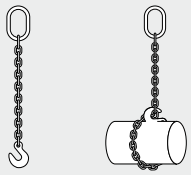
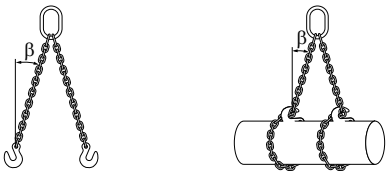
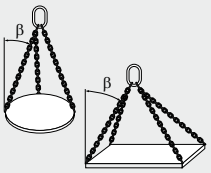
Addition of zinc blocks

Lifting of heavy parts

Lifting of heavy parts

Working load limits

The provided working load limits are the maximal values of the different chain sling types according to the reference method.

Safety factor 4		I-leg-chains		II-leg-chains				III- + IV-leg chains		Endless chain sling
										
Angle of inclination		**-**	**-**	**bis 45°**	**45°–60°**	**bis 45°**	**45°–60°**	**bis 45°**	**45°–60°**	**-**
Load factor		**1**	**0,8**	**1,4**	**1**	**1,12**	**0,8**	**2,1**	**1,5**	**1,6**
Code	**d**	**Load capacity [kg]**								
KWF 8	8	500	400	700	500	560	400	1060	750	800
KWF 10	10	800	625	1120	800	850	625	1675	1180	1250
KWF 13	13	1325	1060	1875	1325	1500	1060	2800	2000	2125
KWF 16	16	2000	1575	2800	2000	2250	1575	4250	3000	3150
KWF 20	20	3150	2500	4250	3150	3550	2500	6600	4750	5000
KWF 22	22	3750	3000	5300	3750	4240	3000	8000	5600	5900

Demanding conditions

If pewag special chains are exposed to special conditions (e.g. asymmetry or edge load), the working load limits defined in the table above must be reduced. In such cases, the load factors stipulated in the table below must be applied. Please take the information given by the user manual into consideration.

When lifting with chains directly on lugs or round loads, it is recommended to use a lug diameter of at least 3 x the pitch of the chain. If this is not the case, the working load limit must be reduced by 50%.

Temperature	-40°C – 475°C		
Load factor	1		
Asymmetric load distribution	The WLL has to be reduced by at least 1 leg. In case of doubt only consider 1 leg as load-bearing.		
Edge load *	R = larger than 2 x d 	R = larger than d 	R = smaller than d 
Load factor	1	0,7	0,5
Shock	slight shocks	medium shocks	strong shocks
Load factor	1	0,7	not permissible

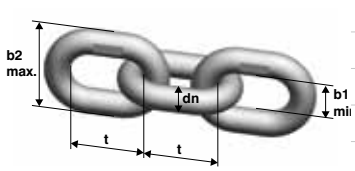
* d = thickness of the material

Chains and Components

Product Overview

KWF Lifting chain

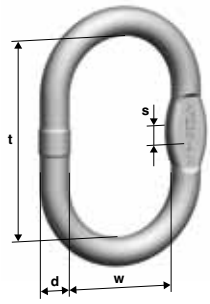
Round steel lifting chain for
hot dip galvanizing plants.



KWF Chain	Code	Nominal-diameter [d]	Standard delivery length [m]	Pitch [t]	Inside width [b1 min.]	Outside width [b2 max.]	Load capacity [kg]	Breaking force [kN]	Weight [kg/m]
	KWF 8	8	50	24	11	29	500	33,3	1,41
	KWF 10	10	50	30	14	36	800	53,2	2,20
	KWF 13	13	50	39	18	47	1.325	88,1	3,71
	KWF 16	16	25	48	22	58	2.000	133	5,62
	KWF 20	20	25	60	27	70	3.150	209	8,76
	KWF 22	22	25	66	30	79	3.750	251	11,18

AWF Master link

For pewag welded system.
Master link for 1-leg chain: AI
Master link for 2-leg chain: AII
Master link for 3- and 4-leg chain - only with transition link BW as on VW. Can also be used as end link AI - for chain classification see column AI.

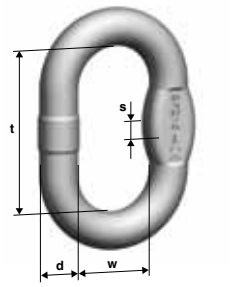


AWF Master link	Code	Load capacity 0–45° [1] [kg]	Can be used up to single hook according to DIN 15401	d [mm]	t [mm]	w [mm]	s [mm]	Weight [kg/pc.]	Master link for chain Ø 1-leg A I [mm]	Master link for chain Ø 2-leg A II [mm]
	AWF 16	500	Nr. 2,5	16	110	60	14	0,53	8	-
	AWF 18	800	Nr. 5	19	135	75	14	0,86	10	8
	AWF 22	1325	Nr. 6	23	160	90	17	1,60	13	10
	AWF 26	2000	Nr. 8	27	180	100	20	2,46	16	13
	AWF 32	3150	Nr. 10	33	200	110	26	4,14	20	16
	AWF 36	4250	Nr. 16	36	260	140	-	6,22	22	20
	AWF 45	5900	Nr. 25	45	340	180	-	12,82	-	22
	AWF 50	8000	Nr. 32	50	350	190	-	16,55	-	-

[1] For load capacity of chain slings please refer to the table on page 15.

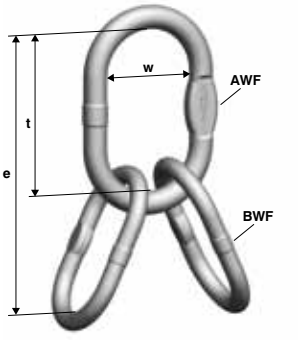
BWF Transition link

For pewag welded system.
Intermediate link or transition link and securing link.

BWF Transition link	Code	Load capacity 0–45° [1] [kg]	d [mm]	t [mm]	w [mm]	s [mm]	Weight [kg/pc.]	Transition link for chain Ø 1- + 2-leg B I/II [mm]
	BWF 10	500	10	44	20	-	0,09	8
	BWF 13	800	13	54	25	10	0,17	10
	BWF 16	1325	17	70	34	14	0,36	13
	BWF 20	2000	20	85	40	-	0,68	16
	BWF 23	3150	23	115	45	17	1,15	20
	BWF 27	4000	27	140	55	20	1,92	22

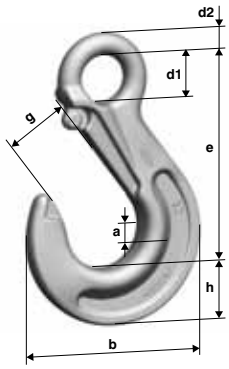
VWF Four leg master link assembly

For pewag welded system. For assembling
of welded chain slings with BW by pewag.

VWF Four leg master link assembly	Code	Consisting of	Load capacity 0–45° [1] [kg]	Can be used up to single hook according to DIN 15401	e [mm]	t [mm]	w [mm]	Weight [kg/pc.]
	VWF 8	AWF 22 + 2 BWF 16	1060	Nr. 6	230	160	90	2,32
	VWF 10	AWF 26 + 2 BWF 20	1675	Nr. 8	265	180	100	3,68
	VWF 13	AWF 32 + 2 BWF 22	2800	Nr. 10	315	200	110	6,46
	VWF 16	AWF 36 + 2 BWF 26	4250	Nr. 16	400	260	140	10,06
	VWF 20	AWF 50 + 2 BWF 32	6600	Nr. 32	500	350	190	22,87
	VWF 22	AWF 50 + 2 BWF 36	8500	Nr. 32	520	350	190	24,79

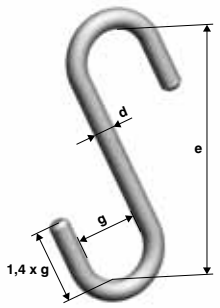
HWF Eye sling hook

For pewag welded system. For general lifting applications.
Hook without safety catch.

HWF Eye sling hook	Code	Load capacity [kg]	e [mm]	h [mm]	a [mm]	d1 [mm]	d2 [mm]	g [mm]	b [mm]	Weight [kg/pc.]
	HWF 8	500	106	27	19	25	11	32	88	0,50
	HWF 10	800	131	33	26	34	16	40	109	1,10
	HWF 13	1325	164	44	33	43	19	48	134	2,20
	HWF 16	2000	183	50	40	50	25	56	155	3,50
	HWF 20	3150	205	55	48	55	27	62	178	5,80
	HWF 22	3750	225	62	50	60	29	72	196	8,00

SMWF S-Hook

Intermediate hook if jaw „g“ of HWF is too small.
Also as an intermediate hook with wire rope loops.
Before use, please make sure that hooks without safety catch are allowed for the intended purpose.

SMWF-S-Hook	Code	Load capacity [kg]	e [mm]	g [mm]	d [mm]	Weight [kg/pc.]
	SMWF 8	500	220	53	23	1,50
	SMWF 10	800	280	58	31	2,90
	SMWF 13	1325	400	90	40	8,20
	SMWF 16	2000	500	120	50	16,00
	SMWF 20	3150	550	130	60	26,00

Construction parts

Further construction parts (e.g. bars, lifting beams or special lifting components) can also be produced to meet customer’s requirements.

User manual

for special sling chains

User manual

This user manual provides information about the use, storage, inspection and maintenance of pewag winner fire chain slings.

General information

pewag winner fire special chain slings for hot galvanizing plants are designed for slinging, lifting and transporting parts to be galvanized. They are also designed to be immersed into zinc-baths. The information given in this catalogue about the chain sling types and the classification of the working load limit takes these circumstances into consideration.

pewag winner fire special chain slings must only be used by competent personnel and in hot dip galvanizing plants. They are not designed to be used in other fields. If properly used, pewag winner fire chain slings have a long service life and offer a high degree of safety. Personal injury and material damage can only be prevented by proper use. It is therefore essential that the operating manual has been read and understood before this product is put into service. However, this does not exclude a responsible and attentive use of the chain sling when lifting the load.

Condition on delivery

A modification of the original condition of the product is not permitted. It is especially important that no welding processes are carried out on pewag chain slings and that they are not subjected to temperature influences over 475°C. The shape of the chain sling must not be modified – e.g. by bending, grinding, dividing parts, boring, etc. Surface coating procedures are only permitted provided that no reaction in or on the material of the chain sling will appear during or after the coating process. In case of doubt, please contact our tecnical service.

Restrictions of use

Temperature: pewag special chain slings for applications in the hot dip galvanizing industry must not be used over the normal temperature range (30°C pickling bath – 475°C zinc bath). See also table on page 15. If this is not the case, the sling must be taken out service.

Use with acids/alkalines or chemical substances:
pewag winner fire special slings for hot dip galvanizing plants can be immersed into pickling baths with a concentration of 15% hydrochloric acid. Material removal is possible due to the material of the chain. Pewag winner fire special slings are not designed to be used with other/higher acids.

Residual risks
All instructions given in this user manual assume the absence of extremely dangerous conditions. Such extremely dangerous conditions include the lifting of people and potentially dangerous loads, such as liquid metals. In these cases, the admissibility and extent of the risks are to be assessed by pewag.

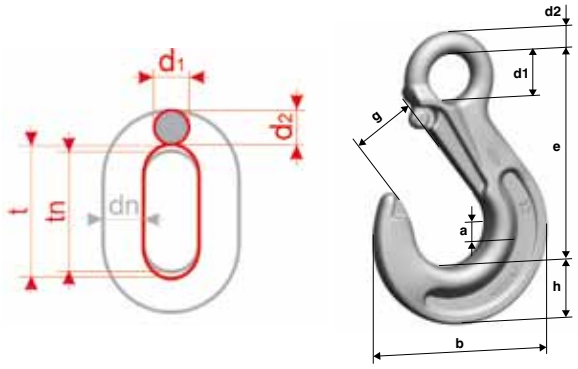
Inspections
Before the first use of a chain sling, following criteria must be applied:
- the delivered chain sling must correspond to the ordered one
- the test certificate/certificate of compliance must also be provided
- the information given by the marking and the working load limit must coincide with the information given by the test certificate or certificate of compliance;
- when necessary, all the details about the chain sling must be saved in a file.
- the operating manual must be available to the user and must be read and understood by the corresponding personnel.

Chain slings must be checked visually before each use. In case of doubt or when one or more withdrawal criteria are met, the chain sling must be removed from service and inspected by an expert.

An inspection of the pickled chain sling must be carried out by a competent person according to national regulations (at least every 14 days). This period must, however, be shortened up in view of the conditions of use – e.g. because of frequent use with maximum load capacity. After extraordinary events which affect the safe working condition of the sling (uncontrable overheating, overloading, collision, etc), the chain sling must be inspected by a qualified person. A load test of the chain and accessories must not be carried out. The load must not exceed the working load limit.

Withdrawal:
The chain sling must be taken out of service if one or more of the following criteria are met.
- Broken parts.
- Missing or illegible identification tag.
- Deformation of the chain or accessories
- Elongation of the chain: the chain must be discarded if $t > 1{,}05tn + (d_n - d_2)$,
- Wear: The mean diameter dm is permitted to be 90% of the nominal size d_n. Dm is determined as the mean value of the diameters d_1 and d_2 measured at right angles on the corresponding cross section. The chain must be discarded if:

$$dm = \frac{d_1 + d_2}{2} < 0{,}9\, d_n$$



- Cuts, nicks, gouges, cracks, signs of high heat conditions or welding processes, bent or twisted links.
- When wear or material removal occurs (e.g. pitting) and the maximal approved dimensional change (see table below) is exceeded
- Signs of „opening out“ of hooks. The enlargement of the hook opening must not exceed 10% of the nominal size.

Maximal approved dimensional change:

Denomination	Dimension	Modification
Chain	dn	-10%
	tn	+5% due to elongation
Links	d	-10%
	t	+10%
HWF	e	+5%
	d2 and h	-10%
	g	+10%
SMWF	e	+5%
	g	+10%
	d	-10%

Repair
Chain slings are only to be repaired by a qualified person. Welding processes, heat treatments and straightening of bent links are forbidden.

Documentation
Inspections and repairs must be documented and retained for the entire service life of the chain sling.

Storage
pewag winner fire chain slings should be stored clean and dry. When stored, they must not be subjected to chemical, thermal and mechanical influences.

Correct use of chain slings

Angle of inclination
The required lifting points and chain type must be chosen in a way that the angles of inclination of all chain legs are within the range indicated on the ID-Tag. All angles of inclination should be the same. Angles of inclination of less than 15° must be avoided, since they put in risk the load stability and they can cause the overloading of the sling. Angles of inclination of more than 60° must be not used.

Edge load – protection of the load and the chain
The working load limit of pewag winner fire chain slings was defined under the assumption that the tension force is set in straight pull, i.e. redirected free of bending influences (edges). In case of edge load, intermediate layers must be used to prevent damages.

For correct and incorrect use, see following figures:

If chains chains are directly in contact with sharp edges without protection, the working load limit will be reduced. Load factors can be found in the table on page 15. When lifting with chains directly on lugs or round laods, it is recommended to use a lug diameter of at least 3 x the pitch of the chain (inside length of the chain link). If this not the case, the working load limit must to be reduced by 50%.

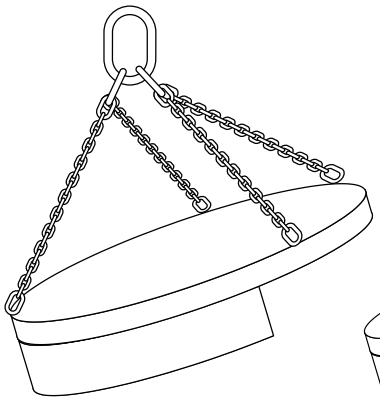
Impact loading
The working load limit of pewag winner fire chain slings was defined under the assumption that the forces acting on each chain leg are free of impacts. When impact loading occurs, the laod factors of page 15 must be taken into consideration. When using hook chains, impacts are forbidden, since the hooks could unhook.

Following criteria are applied:
- slight impacts: created, for example, when accelerating during the lifting or lowering movement
- medium impacts: created, for example, when the chain is loaded but it slips while adjusting to the shape of the load
- strong impacts: created, for example, when the load falls onto an unloaded chain

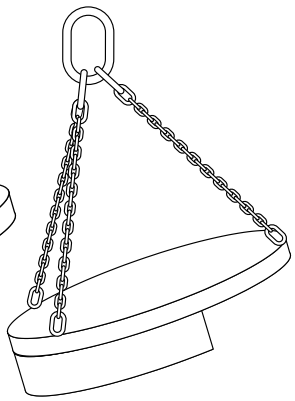
Symmetrical loading
The working load limit of pewag winner fire chain slings was defined under the assumption that the forces acting on each chain leg are simmetrically distributed. When lifting the load, all inclination angles are the same and all chain legs are simmetrically disposed to each other.

The load can still be considered symmetrical when the following conditions are met:
- The load is smaller than 80% of the stated load capacity (WLL)
- The chain sling leg angles to the vertical are smaller than 15°
- The angles to the vertical of all chain legs are identical or deviate max. 15° from each other
- In the case of three- and four- leg chain slings, the corresponding plan angles deviate 15° from each other.

Example of asymmetry
If one of the mentioned parameters is not applied, the lifting process must be assessed by an expert. In case of doubt, only one of the chain legs should be considered as load bearing. For the corresponding WLL, please refer to the working load limit table.



All the load is carried by one chain leg.



All the load is carried by two chain legs.

Use of pewag chain slings for other than the intended purposes
pewag winner fire chain slings must only be used for the defined purposes. For cases where not all individual chain legs of a chain sling can be used simultaneously or where several chain slings are used at the same time, please use the working load limit indicated in the working load table. In case of doubt, the working load limit defined on the ID-tag must be modified according to the following table:

Type of chain sling	Number of chain legs in use	Factor applied to marked WLL
2-leg chain sling	1	1/2
3- and 4-leg chain sling	2	2/3
3- and 4-leg chain sling	1	1/3
2 x 1-leg chain sling	2	1,4 for angles of inclination between 0° and 45°
2 x 2-leg chain sling	3 or 4	1,5 for angles of inclination between 0° and 45°

Individual chain legs which will not be used must be hooked back into the master link in order to prevent hazards caused by free swinging or accidental unhooking of the load.

Before using several chain slings at the same time, make sure that the master links are free to move when attached to the crane hook and cannot unhook during the lifting process. Angles of inclination of more than 45° are not permitted. Only chain slings of the same nominal size and same grade must be used at the same time.

pewag operating manuals can be downloaded under the following link: www.pewag.com.

Waar kunt u ons vinden?

Voor uw dichtstbijzijnde vestiging kunt u kijken op
samenvoorkwaliteit.nl

Wij zijn 24/7 bereikbaar in geval van calamiteiten.

LiftingPlus
Hijsen met visie

samenvoorkwaliteit.nl

van den Berg Bros
Takeltechniek

LiftingPlus BV
Eekhorstweg 21
7942 JC Meppel

T 0522 82 09 05
E info@liftingplus.nl

LiftingPlus Twente BV
Kleibultweg 88a
7575 BX Oldenzaal

T 0541 82 02 80
E info@liftingplus.nl

liftingplus.nl

Van den Berg BrosTakeltechniek BV
Einsteinstraat 8a
8606 JR SNEEK

T 0515 41 44 40
E info@vandenbergbros.nl

takeltechniek.nl