Cam-Alloy Chain Slings

Campbell manufactures a complete line of standard sling assemblies, as well as assemblies to customer specifications. This work is done at authorized Campbell Sling Service Centers located in strategic areas of the country to provide maximum customer service.

Important Chain Terms

WORKING LOAD LIMIT
The "working load limit" (rated capacity) is the maximum combined static and dynamic load in pounds or kilograms which should ever be applied to the product in service, even when the product is new, and when the load is uniformly applied in direct tension to the product.

PROOF TEST
The "proof test" is a quality control test applied to chain for the purpose of verifying weld and material quality. It is the minimum force in pounds or newtons that the chain has withstood in direct tension as part of the manufacturing process. Proof testing assures that the chain is more than capable of performing at its rated working load limit. Proof test loads are a manufacturing integrity test and shall not be used as criteria for service or design purposes. All Campbell chain and components are proof tested in accordance with the applicable ASTM, NACM, OSHA and AISI/ASME requirements.

Certificate of Test and Identification Tags

Campbell provides information in several forms that enables purchasers and users to operate safely and effectively in conformity with OSHA requirements. The drop forged Identification Tag is attached to the Master End Coupling link of each chain sling and provides the following lifetime information:

- Grade
- Size
- Reach
- Working Load Limit (at a specific angle of lift)
- Serial number
- Type

A Certificate of Test is provided for every Campbell manufactured chain sling. The Campbell Certificate contains all of the information provided on the identification tag, plus the Proof Test load as required by OSHA regulations.

Identification Tag

Certificate of Test

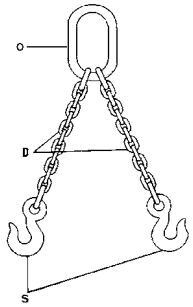
Basic Types of Chain Slings

Slings are designated throughout the industry by the symbols.

First Symbol (Basic type)
S Single Chain Sling with master link and hook, or hook each end.
C Single Choker Chain Sling with master link each end. No hooks.
D Double Chain Sling with standard master link and hooks.
T Triple Chain Sling with standard master link and hooks.
Q Quadruple Chain Sling with standard master link and hooks.
SB Single basket
DB Double basket

Second Symbol (Type of master link or end link)
O Standard Oblong Master Link–Recommended for all types.

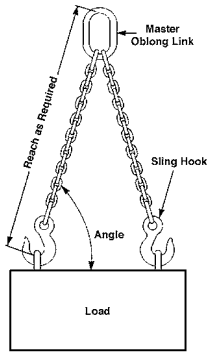
Third Symbol (Type of Hooks)
S Sling Hook
G Grab Hook
F Foundry Hook
SL Self-locking Hook



How to Order Chain Slings

1. Determine the maximum **load** to be lifted.
2. Refer to the following pages and choose the proper **type** of chain sling (single, double, etc.) dictated by the size, shape and weight of the load.
3. Estimate the approximate **angle** between a leg of the sling and the load during operation.
4. Select the proper **attachments** (hooks and master links) for your chain sling.
5. Determine the overall **reach** from bearing point on master link to bearing point on attachment.
6. Refer to the Working Load Limit Chart and to your predetermined angle of the type sling you have selected.
7. Choose the chain size which meets your requirements.
8. When entering your order be sure you give complete information as to the size, reach and attachments required.

Note: Angle to the load on multiple leg slings will be 60° or greater as long as the distance between lifting eyes of load is **not** greater than reach shown on identification tag.



⚠ ADVERTENCIA

Para prevenir la posibilidad de una lesión personal sería:
- **NO EXCEDA** los límites de carga de las cadenas o componentes.
- **NO LA UTILICE** si la cadena o los componentes están visualmente distorsionados o gastados.

⚠ WARNING

To prevent the possibility of serious bodily injury:
- **DO NOT EXCEED** the working load limits for chain or components.
- **DO NOT USE** if the chain or components are visibly distorted or worn.

Inspection, Care and Proper Use of Chain Slings

Campbell welded chain products and components are designed and built for rugged lasting service. As with any quality product certain precautions and standards of treatment should be observed. Proper care will extend the useful life of the product.

INSTRUCTIONS REGARDING COMPONENTS & FITTINGS

Components, such as master links and hooks, should have at least the same working load limit (rated capacity) as the chain with which they are used. If not, the sling shall be rated to the capacity of the weakest component. Campbell offers a full line of Cam-Alloy® and Quik-Alloy® sling components engineered specifically to be compatible with our alloy chain products.

WARNINGS AND CAUTIONS

- The use of chain, slings, and components are subject to certain hazards that cannot be met by mechanical or manufacturing means, but only by the exercise of intelligence, care, and common sense
- Sling use is subject to the Occupational Safety & Health Administration (OSHA 29 CFR 1910.184) and American Society for Mechanical Engineers (ASME B30.9) safety standards, requiring the sling user to conduct safe working practices and perform inspections
- Do not exceed the working load limit of the sling or any component
- Chemically active environments may adversely affect chain slings. Do not use in highly acidic or caustic environments. Campbell should be contacted if the sling will be exposed to chemically active environments during use
- High and low temperatures will affect chain slings. Campbell should be contacted if temperatures below -20°F (-29°C) will be experienced. The attached Effect of Elevated Temperature on the Working Load Limit of Alloy Chain chart shows the reduction in strength that occurs when chain slings are used at or have been exposed to temperatures above 400°F (204°C)
- Never field weld or repair a chain sling. Chain slings should only be repaired by a qualified repair facility
- See other specific information under the Care, Inspection, and Proper Use sections

INSPECTION

OSHA and ASME safety standards require the user to conduct:

a) Frequent Inspections: A visual inspection for damage, which should be performed each day the sling is used.

b) Periodic Inspections: A complete link by link and component inspection. Periodic inspection intervals vary depending on sling usage and conditions, but must occur at least annually. Written records of periodic inspections are required.

The slings should be inspected for the presence damage. The sling should immediately be removed from service if any of the following conditions are present:

- Missing or unreadable identification tag
- Cracks in the chain or any component
- Excessive nicks, gouges or wear. Chain should be removed from service if the thickness at any point on the link is below the value shown in the attached Cam- Alloy Chain Minimum Allowable Thickness chart. All other components should be removed from service if any dimension is worn more than 10% from the original dimension
- Stretched, bent, twisted, or distorted chain links or components
- Excessive corrosion
- Evidence of heat damage
- Evidence of field welding or weld spatter
- Any other condition which questions the integrity of the chain sling
- Any side movement of the Quik Alloy Coupling Link Pin could indicate excessive wear of the pin or link half and be cause for removal from service
- Depending on the severity of use and environment, individual Quik-Alloy components should be disassembled so that load pins may be thoroughly inspected

CARE

- Chain slings should be stored in a clean and dry area, preferably on a rack, in order to extend their life
- Chain slings should not be stored in areas where they would be subject to damage, corrosion, chemical attack, or extreme temperatures
- Clean slings periodically, as dust and grit can accelerate wear
- During use, chain slings should not be dragged over abrasive surfaces. Loads should not be rested on the chain sling to avoid damage

PROPER USE

To protect the operators, the load, and the sling, the following safe practices should be followed. Campbell also recommends compliance with the OSHA and ASME safety standard practices.

- Select a sling suitable for the load, type of hitch, angle of loading, and environment. The hooks and master links should be of a size to fit the intended connections
- Avoid shock loading
- Pad all sharp edges or corners in contact with the sling to prevent damage to either the sling or the load
- Balance the load to prevent shifting, to maintain control of the load, and to prevent overloading of any leg in a multiple leg sling
- Rig so that the load is properly seated in the hooks and master link. Avoid tip loading of hooks and side loading of master links
- Avoid twisting or kinking of sling legs
- Never knot chain legs

Cam-Alloy Chain - Minimum Allowable Thickness

Chain Size		Cat. No. Drum	Actual Size Stock Dia.		Min. Allowable Thickness on Any	
in.	mm		in.	mm	in.	mm
7/32	5.5	**0400312**	.218	6	.189	4.80
9/32	7	**0405212**	.282	7	.239	6.07
3/8	10	**0405412**	.402	10	.342	8.69
1/2	13	**0405512**	.522	13	.443	11.26
5/8	16	**0405612**	.643	16	.546	13.87
3/4	20	**0405712**	.802	20	.687	17.45
7/8	22	**0405812**	.881	22	.750	19.05
1	26	**0401612**	1.000	25	.887	22.53
1 1/4	32	**0402012**	1.250	32	1.091	27.71

Effect of Elevated Temperature on the Working Load Limit of Alloy Chain

Temperature		Grade of Chain			
		Grade 80 (System8)		Grade 100 (System 10)	
(F°)	(C°)	Reduction of Working Load Limit WHILE AT Temperature	Reduction of Working Load Limit AFTER EXPOSURE to Temperature	Reduction of Working Load Limit WHILE AT Temperature	Reduction of Working Load Limit AFTER EXPOSURE to Temperature
< 400°	< 204°	None	None	None	None
400°	204°	10%	None	15%	None
500°	260°	15%	None	25%	5%
600°	316°	20%	5%	30%	15%
700°	371°	30%	10%	40%	20%
800°	427°	40%	15%	50%	25%
900°	482°	50%	20%	60%	30%
1000°	538°	60%	25%	70%	35%
>1000°	>538°	OSHA requires that any chain sling which has experienced temperatures in excess of 1000° F be removed from service.			

PROPER USE (continued)

- Horizontal angles less than 30° should not be used without consulting Campbell or a qualified person
- For choker hitches, angles of choke greater than 120° should not be used without consulting Campbell or a qualified person. Choker hitches reduce the working load limit by 20% (See pages 186 & 187)
- For basket hitches, the minimum recommended diameter of the load is 10 times the nominal chain diameter

Purchasers please note that all "Warnings and Cautions" apply to chain, components and fittings, as well as chain slings. Purchasers are responsible for conveying the "Warnings and Cautions" including the "Inspection, Care and Proper Use" section information to the end user.

Campbell denies any liability for damage that results from use in excess of the working load limit or any abuse or misuse of the product.

Any questions concerning the use of Campbell products may be directed to your Apex Tool Group Sales Representative or Customer Service.

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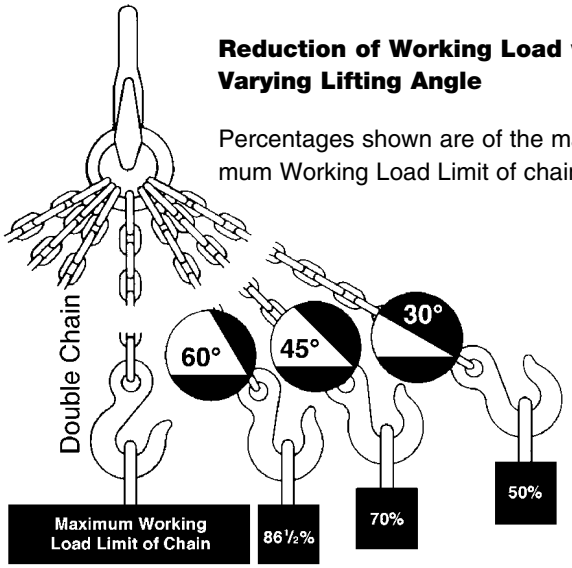
Cam-Alloy Chain Slings

How Lifting Angles Reduce Working Load Limits of Slings



Cam-Alloy Chain Specifications

Cam-Alloy steel chain is electrically welded alloy steel embodying the latest manufacturing technology. Alloy provides a superior chain sling with high tensile strength and excellent wear resistance. The following chains meet or exceed all existing OSHA, ANSI, ASME, NACM and ASTM specification requirements.

The Cam-Alloy chain and attachments used in fabricating Campbell chain slings offer a design factor of 4 to 1. System 8 is Campbell's trade name for Grade 80 chain. System 10 is Campbell's trade name for Grade 100 chain.

Nominal Dimensions (in. and mm)									Drum		Working Load Limit				
Trade Size			Material Diameter		Inside Dimensions Length		Inside Dimensions Width		Cat. No.	UPC No. 020418			Feet/ Drum	Lb/ 100ft.	Links/ ft.
in.	mm	System	in.	mm	in.	mm	in.	mm			lb	kg			
7/32	5.5	8	.22	6	.69	18	.30	8	**0400312**	063312	2100	970	800	43	17.5
9/32	7	10	.29	7	.86	22	.41	10	**0405212**	182204	4300	1950	500	74	13.8
3/8	10	10	.40	10	1.22	31	.57	14	**0405412**	182211	8800	3990	500	148	10.0
1/2	13	10	.52	13	1.57	40	.75	19	**0405512**	182228	15,000	6800	300	250	7.8
5/8	16	10	.64	16	1.93	49	.87	22	**0405612**	182235	22,600	10,250	200	379	6.5
3/4	20	10	.80	20	2.42	61	1.09	28	**0405712**	182242	35,300	16,000	100	610	4.9
7/8	22	10	.88	22	2.70	69	1.28	31	**0405812**	063497	42,700	19,400	100	775	4.4
1	26	8	1.00	25	2.80	71	1.40	36	**0401612**	063510	47,700	21,600	100	965	4.3
1 1/4	32	8	1.25	32	3.50	89	1.75	44	**0402012**	063534	72,300	32,800	60	1525	3.5

The last digit of the catalog number changes to a 1 if a non-standard quantity is ordered.

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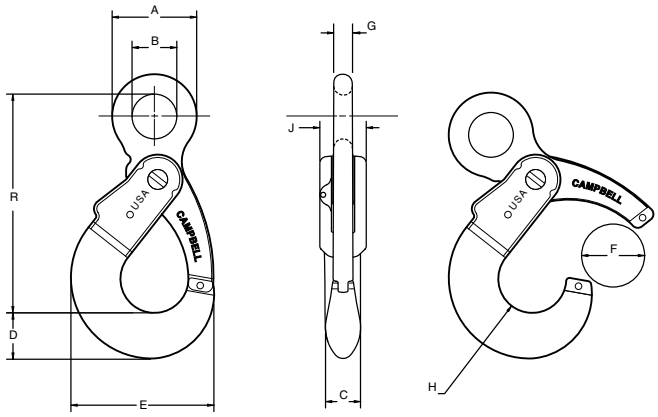
Self-locking Eye Hooks



- Fatigue tested to ASTM A952
- Meets the intent of OSHA regulation 1926.550(g)(4)(iv)(b)
- Latch closes automatically under load
- Integrated forged latch with positive lock capability
- Trigger assembly is completely replaceable
- Eye style is designed to accommodate heavy duty wire rope thimbles
- Stamped with recommended wire rope size

Chain Size in.	Chain Size mm	Cat. No.	UPC No. 020418	Approx. Weight Each lb	Approx. Weight Each kg	Working Load Limit lb	Working Load Limit kg	Wire Rope Size in.	Wire Rope Size mm	Working Load Limit 5 to 1* lb	Working Load Limit 5 to 1* kg
9/32	7	**5648495**	193262	2.25	1.06	4,300	1,950	7/16	11	3,800	1,724
3/8	10	**5648695**	193279	4	1.86	8,800	4,000	1/2	13	7,000	3,175
1/2	13	**5648895**	193286	8.65	3.97	15,000	6,800	5/8	16	12,000	5,443
5/8	16	**5649095**	193293	13.8	6.03	22,600	10,300	7/8	22	18,000	8,165

*To meet the design requirements of Wire Rope Slings.

Chain Size in.	Chain Size mm	Dimensions A in.	A mm	B in.	B mm	C in.	C mm	D in.	D mm	E in.	E mm	F in.	F mm	G in.	G mm	H in.	H mm	J in.	J mm	R in.	R mm
9/32	7	1.875	47.6	1.000	25.4	0.938	23.8	1.020	25.9	3.594	91.3	1.625	41.3	0.438	11.1	0.875	22.2	1.250	31.8	5.468	138.9
3/8	10	2.375	60.3	1.375	34.9	1.125	28.6	1.250	31.8	4.312	109.5	1.875	47.6	0.578	14.7	1.063	27.0	1.500	38.1	6.500	165.1
1/2	13	3.188	81.0	1.688	42.9	1.312	33.3	1.796	45.6	5.404	137.3	2.250	57.2	0.688	17.5	1.281	32.5	1.750	44.5	8.750	222.3
5/8	16	3.500	88.9	2.000	50.8	1.500	38.1	2.169	55.1	6.500	165.1	2.375	60.3	0.750	19.1	1.500	38.1	2.000	50.8	10.000	254.0

Repair Kits

5788495

Hook Size in.	Hook Size mm	Cat. No.	UPC No. 020418
9/32	7	**5788495**	207518
3/8	10	**5788695**	207525
1/2	13	**5788895**	210600
5/8	16	**5789095**	211874

Repair Kit Contents:
- Pivot Pin
- Drive Pins (3)
- Trigger
- Trigger Spring
- Spring Alignment Insert

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