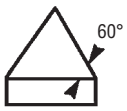
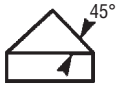
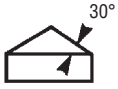
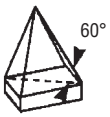
Rated Loads For Grade 80 (System 8) Alloy Steel Chain Slings

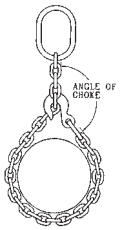
Rated Load for Grade 80 Alloy Steel Chain Slings

Chain Size Nominal		Single Leg Sling - 90° - Horizontal Loading		Rated load Double Leg Sling and Single Basket at Horizontal Angle						Triple and Quadruple Leg Sling and Double Basket at Horizontal Angle					
				 Double at 60°		 Double at 45°		 Double at 30°		 Quad at 60°		 Quad at 45°		 Quad at 30°	
in.	mm	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
7/32	5.5	2,100	950	3,600	1,650	3,000	1,350	2,100	950	5,500	2,450	4,400	2,000	3,200	1,450
9/32	7	3,500	1,600	6,100	2,750	4,900	2,250	3,500	1,600	9,100	4,150	7,400	3,400	5,200	2,400
3/8	10	7,100	3,200	12,300	5,550	10,000	4,500	7,100	3,200	18,400	8,300	15,100	6,800	10,600	4,800
1/2	13	12,000	5,400	20,800	9,450	17,000	7,700	12,000	5,400	31,200	14,150	25,500	11,550	18,000	8,200
5/8	16	18,100	8,200	31,300	14,200	25,600	11,600	18,100	8,200	47,000	21,300	38,400	17,400	27,100	12,300
3/4	20	28,300	12,800	49,000	22,250	40,000	18,150	28,300	12,800	73,500	33,400	60,000	27,250	42,400	19,300
7/8	22	34,200	15,500	59,200	26,850	48,400	21,900	34,200	15,500	88,900	40,250	72,500	32,900	51,300	23,250
1	26	47,700	21,600	82,600	37,500	67,400	30,600	47,700	21,600	123,900	56,250	101,200	45,950	71,500	32,500
1 1/4	32	72,300	32,800	125,200	56,800	102,200	46,400	72,300	32,800	187,800	85,200	153,400	69,600	108,400	49,200

Rated Loads for Grade 80 Alloy Steel Chain Slings - Choker Hitches

Chain Size Nominal		Single Leg		Double Leg and Single Baskets						Triple and Quadruple Leg; Double Baskets					
		90°		60°		45°		30°		60°		45°		30°	
in.	mm	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
7/32	5.5	1,700	750	2,900	1,300	2,400	1,100	1,700	750	4,400	1,950	3,500	1,600	2,550	1,150
9/32	7	2,800	1,300	5,000	2,200	3,900	1,800	2,800	1,300	7,300	3,300	5,900	2,700	4,150	1,900
3/8	10	5,700	2,550	9,800	4,450	8,000	3,650	5,700	2,550	14,700	6,650	12,100	5,450	8,500	3,850
1/2	13	9,600	4,300	16,600	7,550	13,600	6,150	9,600	4,300	25,000	11,300	20,400	9,250	14,400	6,550
5/8	16	14,500	6,550	25,000	11,350	20,500	9,300	14,500	6,550	37,600	17,050	30,700	13,900	21,700	9,850
3/4	20	22,600	10,250	39,200	17,800	32,000	14,500	22,600	10,250	58,800	26,700	48,000	21,800	33,900	15,450
7/8	22	27,400	12,400	47,400	21,500	38,700	17,500	27,400	12,400	71,100	32,200	58,000	26,300	41,000	18,600
1	26	38,200	17,300	66,100	30,000	53,900	24,500	38,200	17,300	99,100	45,000	81,000	36,750	57,200	26,000
1-1 1/4	32	57,800	26,250	100,200	45,450	81,800	37,100	57,800	26,250	150,200	68,150	122,700	55,700	86,700	39,350

Note: Angle of choke should be greater than 120°



ADVERTENCIA

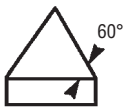
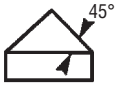
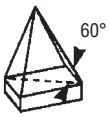
Para prevenir la posibilidad de una lesión personal sería:
- **NO EXCEDA** los límites de carga de las cadenas o componentes.
- **NO LA UTILICE** si la cadena o los componentes están visualmente distorsionados o gastados.

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.

Rated Loads For Grade 100 (System 10) Alloy Steel Chain Slings

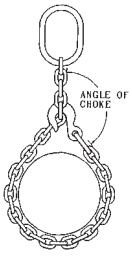
Rated Load for Grade 100 Alloy Steel Chain Slings

Chain Size Nominal		Single Leg Sling - 90° - Horizontal Loading		Rated load Double Leg Sling and Single Basket at Horizontal Angle						Triple and Quadruple Leg Sling and Double Basket at Horizontal Angle					
				 Double at 60°		 Double at 45°		 Double at 30°		 Quad at 60°		 Quad at 45°		 Quad at 30°	
in.	mm	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
9/32	7	4,300	1,950	7,400	3,400	6,100	2,750	4,300	1,950	11,200	5,050	9,100	4,150	6,400	2,950
3/8	10	8,800	4,000	15,200	6,950	12,400	5,650	8,800	4,000	22,900	10,400	18,700	8,500	13,200	6,000
1/2	13	15,000	6,800	26,000	11,800	21,200	9,600	15,000	6,800	39,000	17,650	31,800	14,450	22,500	10,200
5/8	16	22,600	10,300	39,100	17,750	32,000	14,500	22,600	10,300	58,700	26,650	47,900	21,750	33,900	15,400
3/4	20	35,300	16,000	61,100	27,700	49,900	22,650	35,300	16,000	91,700	41,550	74,900	33,950	53,000	24,000
7/8	22	42,700	19,400	74,000	33,500	60,400	27,350	42,700	19,400	110,900	50,250	90,600	41,050	64,000	29,050

Rated Loads for Grade 100 Alloy Steel Chain Slings - Choker Hitches

Chain Size Nominal		Single Leg		Double Leg and Single Baskets						Triple and Quadruple Leg; Double Baskets					
		90°		60°		45°		30°		60°		45°		30°	
in.	mm	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
9/32	7	3,500	1,600	6,100	2,750	4,900	2,250	3,500	1,600	9,100	4,150	7,400	3,400	5,200	2,400
3/8	10	7,100	3,200	12,300	5,550	10,000	4,550	7,100	3,200	18,400	8,300	15,100	6,800	10,600	4,800
1/2	13	12,000	5,400	20,800	9,450	17,000	7,700	12,000	5,400	31,200	14,150	25,500	11,550	18,000	8,200
5/8	16	18,100	8,200	31,300	14,200	25,600	11,600	18,100	8,200	47,000	21,300	38,400	17,400	27,100	12,300
3/4	20	28,300	12,800	49,000	22,250	40,000	18,150	28,300	12,800	73,500	33,400	60,000	27,250	42,400	19,300
7/8	22	34,200	15,500	59,200	26,850	48,400	21,900	34,200	15,500	88,900	40,250	72,500	32,900	51,300	23,250

Note: Angle of choke should be greater than 120°



⚠ 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.

Important Chain Terms

WORKING LOAD LIMIT
The "working load limit" (rated capacity) is the maximum combined static and dynamic load in pounds or kilograms that should never 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 proof tested chain and components are proof tested in accordance with the applicable ASTM, NACM and AISI/ASME requirements.

Warnings, Cautions, Inspection and Proper Use of Chain

Campbell 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 AND FITTINGS
Components, such as hooks or shackles, should have at least the same working load limit (rated capacity) as the chain with which they are used. If not, the assembly shall be rated to the capacity of the weakest component. Campbell offers a full line of components engineered specifically to be compatible with our chain products.

WARNINGS AND CAUTIONS
- The use of chain is subject to certain hazards that cannot be met by mechanical or manufacturing means, but only by the exercise of intelligence, care, and common sense
- **Do not exceed the working load limit of the chain or any component**
- Chemically active environments may adversely affect chain and components. Do not use in highly acidic or caustic environments. Campbell should be contacted if the chain will be exposed to chemically active environments during use
- High and low temperatures will affect chain and components. Campbell should be contacted if temperatures below -20°F (-29°C) or above 400°F (200°C) will be experienced
- Chains used in certain applications are subject to governmental regulations. Please follow all Federal, State and/or Local Department of Transportation, OSHA, or other applicable standards and regulations when using Campbell products
- Never field weld or repair chain
- See other specific information under "Inspection and Proper Use" sections

INSPECTION
Regular inspections should be conducted on chain to detect damage or deterioration from use. The chain should be inspected for any of the below conditions. If present, the chain should immediately be removed from service.
- Cracks in the chain or any component
- Excessive nicks or gouges
- Excessive wear. Chain should be removed from service if the thickness at any point on the link is below the value shown in the Chain Minimum Allowable Thickness chart. All other components should be removed from service if any dimension is worn by 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 splatter
- Any other condition which questions the integrity of the chain

PROPER USE
To protect the users and to prevent damage to the chain, the following safe practices should be followed:
- Select a chain suitable for the application and environment
- The hooks or other components should be of a size to fit the intended connections
- Avoid shock loading
- Pad all sharp edges or corners in contact with the chain
- Rig so that the load is properly seated in the hooks or other components. Avoid tip loading of hooks and side loadingof chain and components
- Avoid twisting or kinking the chain
- Never knot chain

Purchasers please note that all "Warnings and Cautions" apply to chain as well as all components and fittings. Purchasers are responsible for conveying the "Warnings and Cautions," including the "Inspection" 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 Apex Tool Group Customer Service representative.

OTHER PRODUCTS
Campbell produces a number of products for specialty applications. Please contact your Apex Tool Group Sales representative, or Customer Service representative, if you have special requirements.

Not all products produced by Campbell appear in this catalog. Campbell can produce engineered chain to meet customer design specifications, and also produces a variety of chain assemblies. Minimum order quantities may apply to special order products.

NOTICE: The product specifications and dimensions are as accurate as possible at the time of printing. However, because we are continually improving the quality and design of our products, they can change without notice.

The dimensions and weights are approximate nominal values, and some variation will occur. If specific dimensional requirements are necessary for the application, please contact your Apex Tool Group Sales representative, or Customer Service representative.

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

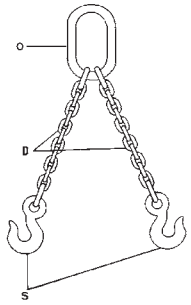
A Certificate of Test is provided for every Campbell manufactured chain sling. The Campbell Certificate contains all of the information provided on the identification tag, plus the Proof Test load as required by OSHA regulations.

Identification Tag

Certificate of Test

Basic Types of Chain Slings

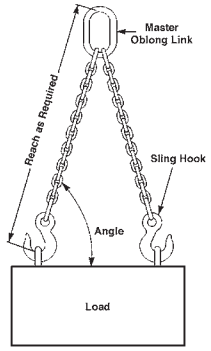
Slings are designated throughout the industry by the symbols.
First Symbol (Basic type)
S Single Chain Sling with master link and hook, or hook each end.
C Single Choker Chain Sling with master link each end. No hooks.
D Double Chain Sling with standard master link and hooks.
T Triple Chain Sling with 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 in.	Chain Size mm	Cat. No. Drum	Actual Size Stock Dia. in.	Actual Size Stock Dia. mm	Min. Allowable Thickness on Any in.	Min. Allowable Thickness on Any 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 (F°)	Temperature (C°)	Grade of Chain: Grade 80 (System8) Reduction of Working Load Limit WHILE AT Temperature	Grade 80 (System8) Reduction of Working Load Limit AFTER EXPOSURE to Temperature	Grade 100 (System 10) Reduction of Working Load Limit WHILE AT Temperature	Grade 100 (System 10) 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.

⚠ 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.