

Campbell®

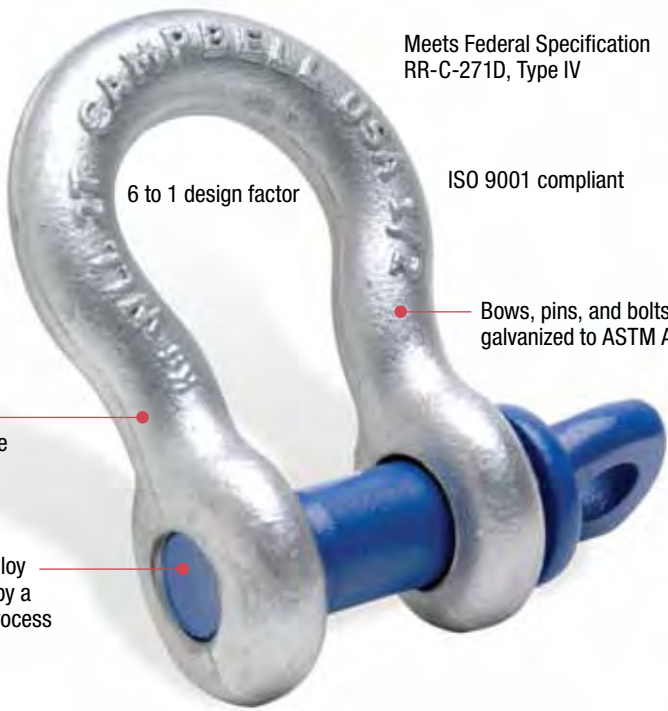
Campbell can trace its beginnings back to 1834, when one of the many companies that eventually became what is today the Campbell® brand began manufacturing harnesses for horses. Over the years, countless products were added, including wire rope and chain fittings, drop-forged chain hardware, high quality tackle blocks, shackles, hooks, and much more.

Today, Campbell is the best-selling brand of welded and weldless chain in the United States. Users can select from a wide range of working load capacities, including proof coil, high test, transport, and alloy. Many finishes, styles, and materials are also available. Campbell chains and assemblies, including slings for overhead lifting, tie-downs, and binder chains, have earned the brand an outstanding reputation for quality.

Innovation is also a key element of the Campbell philosophy. Grade 100 chain was pioneered and developed by Campbell, resulting in products that featured 25% higher working load limits, manufactured proof tests, and design strengths than Grade 80 chain products. This kind of innovation, combined with unparalleled technical support, expertise, and training, provides Campbell customers with a level of satisfaction unrivaled in the industry.



ANCHOR SHACKLES



Meets Federal Specification RR-C-271D, Type IV

6 to 1 design factor

ISO 9001 compliant

Statistically tested for hardness, tensile strength, impact resistance, ductility and fatigue

Bows, pins, and bolts galvanized to ASTM A-153

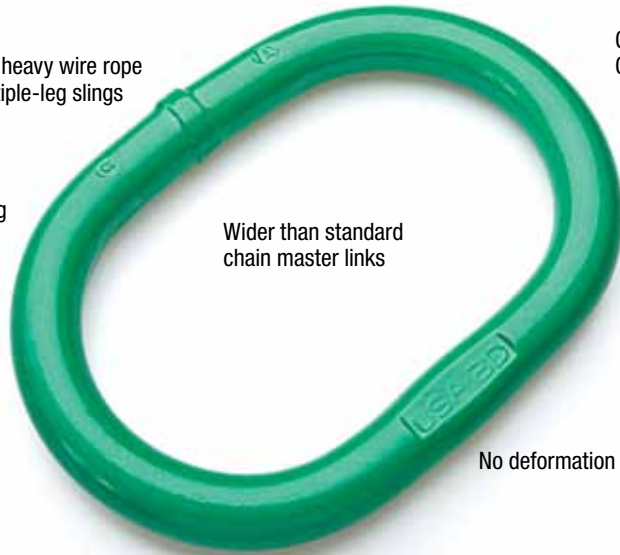
Drop-forged for superior strength and performance

Pins and bolts made of alloy steel; through hardened by a quench and tempering process



Date Code, "WLL" (Working Load Limit), "Campbell" or "CC", "USA" and size are permanently forged on shackle bow

EXTRA-WIDE MASTER LINKS



Accommodates heavy wire rope thimbles in multiple-leg slings

Grade 100 Chain Strength

Usable with Quik-Alloy® coupling links for double leg slings

Wider than standard chain master links

100% proof tested in accordance with ASTM A952

5:1 Design Factor; meets or exceeds all ASME B30.26

No deformation at proof test loads



"USA", Date Code, and Link Number stamped on every link

Camtrol System

Campbell's CAMTROL SYSTEM makes chain products easier to identify and understand. That's because all are based on engineering formulas computed according to ISO (International Organization for Standardization), NACM (National Association of Chain Manufacturers) and ASTM (American Society for Testing and Materials). Use the CAMTROL SYSTEM to make wise chain purchasing decisions. Use it to compare the various categories of chain, to choose the right chain for the job according to the price per thousand pounds of working load instead of buying on a price per foot.

Consult your Campbell Chain distributor for current prices. Then refer to the chart below and divide the price per foot by the working load limit (in thousands of pounds) shown in the table.

By using this comparison system you will discover that you can buy a smaller, easier to handle chain, and at less cost based on its working load limit.

VARIATIONS IN FINISH OR HEAT TREATMENT

The mechanical properties shown on the Camtrol Chart apply only to the various chains in their standard finish and heat treated condition. Finishes such as galvanizing or electroplating may reduce strengths. The manufacturer's revised recommendations should be solicited when such treatments are desirable for specific applications.

HALLMARKING (IDENTIFICATION)

All System 4, 7, 8, and 10 chains and all System 3 chains 5/16" (8 mm) and larger are marked with the grade identifier approximately every 12" or less. Please refer to the chain type of interest in this catalog for the specific hallmarks.

Grade	Camtrol System Number	Trade Size		Diameter		Inside Length		Inside Width		Weight Per 100 Feet		Working Load Limit	
		in	mm	in	mm	in	mm	in	mm	lb	kg	lb	kg
30	3	1/8	4.0	0.156	4.0	0.89	22.61	0.29	7.33	22	10	400	180
30	3	3/16	5.5	0.205	5.5	0.95	24.13	0.34	8.63	35	16	800	365
30	3	1/4	7.0	0.260	7.0	1.20	30.50	0.45	11.40	56	25	1,300	580
30	3	5/16	8.0	0.312	8.0	1.27	32.27	0.47	11.93	83	38	1,900	860
30	3	3/8	10.0	0.369	10.0	1.36	34.46	0.57	14.47	125	57	2,650	1,200
30	3	1/2	13.0	0.480	13.0	1.70	43.18	0.75	19.00	237	108	4,500	2,030
30	3	5/8	16.0	0.656	16.7	2.10	53.34	0.87	22.09	390	177	6,900	3,130
30	3	3/4	20.0	0.781	19.8	2.70	68.58	1.02	26.00	535	243	10,600	4,810
30	3	7/8	22.0	0.906	23.0	2.34	59.44	1.37	34.80	770	349	12,800	5,810
43	4	1/4	7.0	0.276	7.0	1.20	30.50	0.45	11.40	63	28	2,600	1,180
43	4	5/16	8.0	0.330	8.4	1.27	32.27	0.47	11.94	102	46	3,900	1,770
43	4	3/8	10.0	0.380	10.0	1.36	34.54	0.58	14.73	130	59	5,400	2,450
43	4	7/16	11.9	0.468	11.9	1.29	32.77	0.67	17.02	216	98	7,200	3,270
43	4	1/2	13.0	0.531	13.0	1.70	43.18	0.75	19.00	260	118	9,200	4,170
43	4	5/8	16.0	0.656	16.7	1.94	49.27	0.93	23.62	356	161	13,000	5,910
43	4	3/4	20.0	0.781	23.0	2.21	56.13	1.10	27.94	535	243	20,200	9,180
70	7	1/4	7.0	0.312	7.9	0.94	23.88	0.46	11.68	91	41	3,150	1,430
70	7	5/16	8.7	0.343	8.7	1.15	29.21	0.48	11.68	111	50	4,700	2,130
70	7	3/8	10.0	0.406	10.0	1.36	34.46	0.57	14.47	150	68	6,600	2,990
70	7	7/16	11.9	0.468	11.9	1.29	32.77	0.67	17.02	212	96	8,750	3,970
70	7	1/2	13.0	0.531	13.0	1.70	43.18	0.75	19.00	260	118	11,300	5,130
70	7	5/8	16.0	0.630	16.0	1.93	49.02	0.87	22.10	375	170	15,800	7,170
80	8	7/32	5.5	0.218	5.5	0.69	17.53	0.30	7.62	43	20	2,100	970
80	8	5/16	8.0	0.315	8.0	0.94	23.88	0.46	11.68	92	42	4,500	2,000
80	8	1	26.0	1.000	25.4	2.80	71.12	1.40	35.56	965	438	47,700	21,600
80	8	1-1/4	32.0	1.250	31.8	3.50	88.90	1.75	44.45	1525	692	72,300	32,800
100	10	9/32	7.0	0.285	7.2	0.86	21.80	0.41	11.40	74	34	4,300	1,950
100	10	5/16	8.0	0.330	8.4	1.01	25.70	0.50	13.00	104	47	5,700	2,600
100	10	3/8	10.0	0.402	10.2	1.22	31.00	0.55	14.00	148	67	8,800	3,990
100	10	1/2	13.0	0.522	13.2	1.54	39.90	0.45	19.10	250	113	15,000	6,800
100	10	5/8	16.0	0.643	16.3	1.93	49.00	0.87	22.10	379	172	22,600	10,250
100	10	3/4	20.0	0.802	20.4	2.42	61.50	1.09	27.70	598	271	35,300	16,000
100	10	7/8	22.0	0.882	22.4	2.70	68.52	1.28	32.48	775	351	42,700	19,400

WARNING:

To prevent the possibility of serious bodily injury:

- DO NOT USE for overhead lifting or hoisting.

- 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 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 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 component
- 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 loading of 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.

Care and Maintenance of Chain

Trade Size			Nominal Material Diameter		Min. Allowable Thickness on Link	
in	mm	Chain Type or Grade	in	mm	in	mm
4	3.0	Machine, Coil	0.120	3.0	0.104	2.64
3	3.4	Machine, Coil	0.135	3.4	0.117	2.97
2	3.8	Machine, Coil	0.148	3.8	0.128	3.25
1	4.1	Machine, Coil	0.162	4.1	0.140	3.56
1/0	4.5	Machine, Coil	0.177	4.5	0.153	3.89
2/0	4.9	Machine, Coil, Passing Link	0.192	4.9	0.166	4.22
3/0	5.3	Machine, Coil	0.207	5.3	0.179	4.55
4/0	5.5	Machine, Coil, Passing Link	0.218	5.5	0.189	4.80
5/0	6.4	Machine, Coil	0.250	6.4	0.217	5.50
1/8	4.0	Grade 30	0.156	4.0	0.135	3.43
3/16	5.5	Grade 30, 80, 100	0.217	5.5	0.189	4.80
1/4 - 9/32	7.0	Grade 30, 43, 70, 80, 100 (Grade 43 = 0.281)	0.276	7.0	0.239	6.07
5/16	8.4	Grade 30	0.331	8.4	0.236	7.28
5/16	8.7	Grade 43, 70	0.343	8.7	0.297	7.54
5/16	8.0	Grade 80, 100	0.312	8.0	0.273	6.93
3/8	10.0	Grade 30, 80, 100	0.394	10.0	0.342	8.69
3/8	10.3	Grade 43, 70	0.406	10.3	0.351	8.93
7/16	11.9	Grade 30, 43, 70	0.468	11.9	0.405	10.30
1/2	13.0	Grade 30, 80, 100	0.512	13.0	0.443	11.26
1/2	13.5	Grade 43, 70	0.531	13.5	0.460	11.68
5/8	16.0	Grade 30, 43, 70	0.630	16.0	0.546	13.87
3/4	20.0	Grade 80, 100	0.787	20.0	0.687	17.45
7/8	20.0	Grade 30, 43, 80, 100	0.866	22.0	0.750	19.05
1	26.0	Grade 30, 80	1.020	26.0	0.887	22.53
1-1/4	32.0	Grade 80	1.260	32.0	1.091	27.71

⚠ WARNING: Remove chain from service if the thickness is less than the minimum shown, at any location on the link

Finish Abbreviations

- (S.C.) stands for Self Colored. A finish without any cleaning operations to remove oil or dirt or surface oxidation from the welding process.
- (BRT) stands for Bright. A finish where the surface is cleaned by shot peening or tumbling to produce a clean bright surface
- (Z.P.) stands for Zinc Plated, Campbell's method of zinc electroplating. The zinc electroplating is an attractive finish that also serves to prevent the onset of rust on the chain.
- (Y.C.) stands for Yellow Chromate, a name for Campbell's method of zinc electroplating with a yellow chromate finish. The zinc electroplating is an attractive finish that also serves to prevent the onset of rust on the chain. The chromate finish serves to protect the zinc electroplate
- (GALV) stands for Hot-dip Galvanized. Hot-dip galvanizing is a process where the chain is immersed in a molten zinc. This produces both a chemical reaction between the steel and the zinc, as well as an outside layer of zinc on the chain. The end result is an adherent coating of zinc that is much thicker than that produced by zinc electroplating. Corrosion resistance is proportional to zinc thickness, and therefore galvanized products offer superior corrosion resistance to electroplated products. NOTE: Due to temperature of the molten zinc, the strengths of hot-dip galvanized products are often reduced by 15%.
- (M-GALV) stands for Mechanically Galvanized. Mechanical galvanizing is a process where zinc powder is mechanically applied to the outside of the chain. Because this is a mechanical process and not a molten process, the coating is very uniform.
- (Polycoated) is a finish where the chain is coated with a colored plastic powder which is then fused onto each link.

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