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CHAIN

Our chain manufacturing roots date back to the late 1800s and the Columbus Chain Company. We hold patents in chain and chain link design as well as patents in chain manufacturing processes, which help ensure our chain is the strongest and most reliable on the market today. We also invented the first alloy chain in 1933 – the forerunner to our industry-changing Herc-Alloy 800® and 1000 chains.

Today, Columbus McKinnon is an industry-leading chain manufacturer. Relying on more than a century of chain-making expertise and innovation, we manufacture a wide selection of welded graded chain in Tennessee, for use in a variety of industries. We have always been an innovator in chain and rigging products, and we continually work to improve our processes and materials to ensure we manufacture the best chain in the industry year after year.

GRADED WELDED CHAIN AT A GLANCE

<table>
<thead>
<tr>
<th>GRADE</th>
<th>ASTM &amp; NACM Grade</th>
<th>CM Chain Embossment</th>
<th>ASTM Specification</th>
<th>Name</th>
<th>Typical Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>G30</td>
<td>A413</td>
<td>Proof Coil</td>
<td>General-purpose, low-carbon chain for industrial and agricultural applications including guard rails, logging and load securement. <strong>Not to be used for overhead lifting.</strong></td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>G43</td>
<td>A413</td>
<td>High Test</td>
<td>Grade 43 chain is manufactured to meet ASTM &amp; NACM specifications. Typical uses include container securement, logging, towing and marine industry applications. Grade 43 is available in many finishes. <strong>Not to be used for overhead lifting.</strong></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>G70</td>
<td>A413</td>
<td>Transport</td>
<td>A higher-strength, heat-treated carbon steel chain typically used by truckers, loggers and highway crews for load securement, towing, lashing and as trawler chain. Load ratings of Grade 70 chain are approximately 20% higher than Grade 43. <strong>Not to be used for overhead lifting.</strong></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>HA800</td>
<td>A391</td>
<td>Alloy</td>
<td>A higher-strength, heat-treated alloy steel chain primarily used as a sling component for overhead lifting, but can also be used in rigging and tie-down applications where a lighter weight, higher strength chain is desirable. <strong>Recommended for overhead lifting by NACM, ASME and OSHA.</strong></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>HA1000</td>
<td>A973</td>
<td>Alloy</td>
<td>With approximately 25% higher strength than Grade 80, Grade 100 chain is used primarily as a sling component for overhead lifting. Grade 100 chain can be used for all of the same applications as Grades 30 through 80. <strong>Recommended for overhead lifting by NACM, ASME and OSHA.</strong></td>
<td></td>
</tr>
<tr>
<td>Chain Size (in.)</td>
<td>Grade 30 (Proof Coil)</td>
<td>Grade 43 (High Test)</td>
<td>Grade 70 (Transport)</td>
<td>Herc-Alloy 800® (Grade 80)</td>
<td>Herc-Alloy® 1000 (Grade 100)</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------</td>
<td>----------------------</td>
<td>----------------------</td>
<td>---------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td>Chain Size (in.)</td>
<td>Wire Diameter Nominal (in.)</td>
<td>Inside Length Nominal (in.)</td>
<td>Inside Width Nominal (in.)</td>
<td>Weight Per 100 ft (lbs.)</td>
</tr>
<tr>
<td>3/16</td>
<td>0.22</td>
<td>0.97</td>
<td>0.45</td>
<td>39.8</td>
<td>800</td>
</tr>
<tr>
<td>1/4</td>
<td>0.28</td>
<td>1.22</td>
<td>0.51</td>
<td>64.6</td>
<td>1,300</td>
</tr>
<tr>
<td>5/16</td>
<td>0.33</td>
<td>1.27</td>
<td>0.60</td>
<td>97.6</td>
<td>1,900</td>
</tr>
<tr>
<td>3/8</td>
<td>0.39</td>
<td>1.35</td>
<td>0.58</td>
<td>140.2</td>
<td>2,650</td>
</tr>
<tr>
<td>1/2</td>
<td>0.50</td>
<td>1.73</td>
<td>0.81</td>
<td>227.0</td>
<td>4,500</td>
</tr>
<tr>
<td>5/8</td>
<td>0.63</td>
<td>1.92</td>
<td>0.86</td>
<td>363.0</td>
<td>6,900</td>
</tr>
<tr>
<td>3/4</td>
<td>0.78</td>
<td>2.40</td>
<td>1.07</td>
<td>568.0</td>
<td>10,600</td>
</tr>
<tr>
<td></td>
<td>0.28</td>
<td>1.22</td>
<td>0.51</td>
<td>64.6</td>
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<tr>
<td></td>
<td>0.34</td>
<td>1.25</td>
<td>0.54</td>
<td>104.0</td>
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</tr>
<tr>
<td></td>
<td>0.39</td>
<td>1.35</td>
<td>0.58</td>
<td>140.3</td>
<td>5,400</td>
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<tr>
<td></td>
<td>0.50</td>
<td>1.73</td>
<td>0.81</td>
<td>227.0</td>
<td>9,200</td>
</tr>
<tr>
<td></td>
<td>0.63</td>
<td>1.92</td>
<td>0.86</td>
<td>363.0</td>
<td>13,000</td>
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<tr>
<td></td>
<td>0.78</td>
<td>2.40</td>
<td>1.07</td>
<td>568.0</td>
<td>20,200</td>
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<td>0.47</td>
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<td></td>
<td>0.33</td>
<td>0.98</td>
<td>0.46</td>
<td>100.5</td>
<td>4,700</td>
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<tr>
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<td>0.50</td>
<td>96.9</td>
<td>4,700</td>
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<tr>
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<td>0.54</td>
<td>145.5</td>
<td>6,600</td>
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<tr>
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<td>1.38</td>
<td>0.60</td>
<td>136.5</td>
<td>6,600</td>
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<tr>
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<td>0.53</td>
<td>1.56</td>
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<td>267.0</td>
<td>11,300</td>
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<tr>
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<td>0.22</td>
<td>0.68</td>
<td>0.31</td>
<td>44.3</td>
<td>2,100</td>
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<tr>
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<td>0.28</td>
<td>0.88</td>
<td>0.40</td>
<td>72.9</td>
<td>3,500</td>
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<tr>
<td></td>
<td>0.32</td>
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<td>0.46</td>
<td>90.9</td>
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<td>0.51</td>
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<td>12,000</td>
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<td>1.78</td>
<td>0.86</td>
<td>382.3</td>
<td>18,100</td>
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<td>0.79</td>
<td>2.23</td>
<td>1.07</td>
<td>595.0</td>
<td>28,300</td>
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<tr>
<td></td>
<td>0.88</td>
<td>2.25</td>
<td>1.14</td>
<td>776.0</td>
<td>34,200</td>
</tr>
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<td>1.00</td>
<td>3.07</td>
<td>1.49</td>
<td>941.0</td>
<td>47,700</td>
</tr>
<tr>
<td></td>
<td>1.25</td>
<td>3.92</td>
<td>1.74</td>
<td>1,420.0</td>
<td>72,300</td>
</tr>
</tbody>
</table>

* Standard Link Grade 70 Chain
CHAIN SLINGS

Chain slings are a combination of chain, hooks, rings or other attachments used primarily for overhead lifting applications. Slings are generally used in conjunction with a crane or some type of lifting device and allow riggers to create a custom configuration to lift a load depending on the needs of the unique application.

CHAIN SLING CONFIGURATIONS

Standard sling configurations consist of chain branches that are affixed on one end to a master link or ring with some type of attachment, typically a hook, attached to the opposite end. CM manufactures a variety of standard sling configurations, including single, double, triple and quad chain slings. The following symbols are used to describe a sling.

FIRST SYMBOL (BASIC TYPE):

- **S**: Single chain sling
- **C**: Single choker chain sling with a standard end link on each end, no hooks.
- **D**: Double branch chain sling (2 legs)
- **T**: Triple branch chain sling (3 legs)
- **Q**: Quadruple branch chain sling (4 legs)

SECOND SYMBOL

(TYPE OF MASTER OR END LINK):

- **O**: Oblong master link of standard dimensions
- **P**: Pear shaped master link (available on request)
- **R**: Ring

THIRD SYMBOL (TYPE OF HOOK):

- **S**: Sling Hook
- **G**: Grab Hook
- **F**: Foundry Hook
- **L**: Latchlok

A hook safety latch is not required by OSHA. However, if a latch is present it must be in working condition.

If attachments are other than standard, give detailed specifications.

Sling tags are stamped 1 to 4 to reflect number of branches. Additional coding is defined as follows:

- **AS**: Adjustable Single
- **ES**: Endless Single
- **SAL**: Single Adjustable Loop
- **AD**: Adjustable Double
- **SB**: Single Basket
- **ED**: Endless Double
- **DAL**: Double Adjustable Loop
- **DB**: Double Basket

Special configurations available upon request.
**STANDARD TYPES OF CM CHAIN SLINGS**

**SINGLE CHAIN SLINGS** : TYPE S & C

A quad branch chain sling, especially when used on a load of rigid structure, is usually not sustaining the load evenly on each of its four branches. The maximum working load limits are therefore set at the same values as triple branch chain slings of equal quality and size with branches used at same angle of inclination.

**DOUBLE CHAIN SLINGS** : TYPE D

**TRIPLE CHAIN SLINGS** : TYPE T

**QUADRUPLE CHAIN SLINGS** : TYPE Q

**SAFETY NOTE**
A quad branch chain sling, especially when used on a load of rigid structure, is usually not sustaining the load evenly on each of its four branches. The maximum working load limits are therefore set at the same values as triple branch chain slings of equal quality and size with branches used at same angle of inclination.

**SLING ID TAGS**

CM sling configurations come with an affixed metal identification tag that includes:

- Sling size
- Sling reach
- Working load limit (all slings must be rated by their weakest component)
- Serial number
- Manufacturer name (CM) and grade of sling
- Number of branches

Permanently affixed sling ID tags are required per ASME B30.9 and OSHA 1910.184. To order replacement sling ID tags, contact customer service.
HOO K S

Whether you’re lifting, pulling, towing or securing loads, the Columbus McKinnon line of hooks has you covered. Our history in rigging-type products dates back more than 100 years, and we rely on this long-standing knowledge and expertise to develop durable and reliable hooks that can stand up to even the toughest overhead lifting and binding applications.

Available in numerous grades and materials, we have a variety of hook styles for both overhead and non-overhead lifting applications. Learn more about all of our available hook styles below.

OVERHEAD LIFTING HOOKS

Not all hooks are appropriate for overhead lifting. When choosing an overhead lifting hook, it’s important to consider the application you will be using it for. If you are lifting a plate, you may need one type of hook, while lifting a vehicle engine may require another. Only alloy hooks should be used in overhead lifting applications. Below are various types of hooks CM recommends for overhead lifting applications.

CLEVLOK® HOOKS

CM trademarked Clevlok® Herc-Alloy® Hooks are typically used for overhead lifting applications. This line of hooks offers easy installation in the shop or in the field. These hooks are 100% proof tested at the factory, thus requiring no additional testing once installed.

EYE HOOKS

CM Herc-Alloy® Eye Hooks are an excellent choice for welded assemblies. For some applications, they also may be used with mechanical couplers such as the CM Hammerlok®. These hooks are designed for overhead lifting and can be used in place of Clevlok® hooks if preferred. Overhead lifting eye hooks are 100% proof tested at the factory, thus requiring no additional testing once installed using the CM Hammerlok.

“S” HOOKS

CM Herc-Alloy® “S” Hooks are built and designed for special lifting applications. CM “S” hooks are 100% proof tested at the factory and can be used for various applications where a wide throat opening is desired.

PLATE HOOKS

CM Herc-Alloy® Plate Hooks are designed for lifting plate material, like steel, in vertical and horizontal orientations. Plate hooks should be used in pairs and careful attention should be paid to sling angles when determining the working load limit.

SORTING HOOKS

CM Sorting Hooks are designed to lift and move material with long narrow throat openings. Sorting hooks are 100% proof tested and are available with and without handles.

HEAVY-DUTY CRANE HOOKS

CM Heavy-Duty Crane Hooks are forged at Columbus McKinnon’s STB (Stahlhammer Bommern) manufacturing facility in Hamm, Germany of high-quality German alloy steel. This category offering includes single hooks, ramshorn (double) hooks, eye hooks, cargo hooks and cross hooks, ranging from 1 to 1,250 metric ton capacities.
NON-OVERHEAD LIFTING HOOKS

Non-overhead lifting hooks are designed for pulling or load securement application. These hooks do not have the same requirements as those used for overhead lifting. Non-overhead lifting hooks are available in Grades 30, 43, and 70. Grade 80 hooks that are not suitable for overhead lifting are marked T-80 and should only be used for load securement.

CLEVIS HOOKS

Clevis Hooks are not designed for overhead lifting, but instead are most often used for load securement with tie-down chains. Clevis hooks are easy to install in the field and can be used in combination with various grades of chain including Grade 30, 43, 70 and 80. These feature a U-shaped attachment point with a pin to secure chain or other rigging attachments. Different grades of clevis hooks have different working load limits, therefore you must ensure you use the correct hook grade and size for your application.

EYE HOOKS

(Non-Cradle Grab & Slip Hooks)

Standard Eye Hooks are not designed for overhead lifting, but instead are most often used for load securement with tie-down chains. Eye hooks are used in combination with various grades of chain including Grade 30, 43, 70 and 80. Eye hooks feature a simple circular attachment point for rigging chain or other attachments. Different grades of eye hooks have different working load limits, therefore you must ensure you use the correct hook grade and size for your application.

HOOK INSPECTION & USE

**INSPECTION:**
- Discard hooks that are worn more than 10% of the original dimension or are worn beyond a specific dimension or tolerance as provided in a wear allowance table, chart or diagram.
- Discard hooks that have an increase in throat or slot opening more than 5% of the original opening (not to exceed 1/4 inch).
- Discard hooks with any visibly apparent bend or twist from the plane of the unbent hook.
- Replace load pins that are permanently distorted.
- Hooks should not be subjected to bending, exposed to sharp objects or tip loaded.
- Replacement load pins shall be obtained from the manufacturer of the hook.

**USE:**
- Care should be exercised during use, so the hook is not abused or damaged.
- Hooks attached to chain should be selected to match the size and working load limit of the chain.
- Do not exceed the working load limit or shock load the chain or attachments. Loads applied rapidly or dropped freely can result in serious overloading of the hook.
- Use proper size chain in the throat of the grab hook.
- Hooks should not be subjected to bending, exposed to sharp objects, tip loaded (unless specified by the manufacturer) or loaded in a manner inconsistent with its design.
- Avoid exposure to corrosive mediums or high temperatures that could affect the thermal treatment and strength of the hook.
- Hooks can be used from -40 degrees F to 400 degrees F without reduction of working load limit. Call the manufacturer if you exceed these temperatures.

Refer to American Society of Mechanical Engineers ASME B30.10 for a discussion of hooks, inspection procedures and operating practices.

LOW HORIZONTAL ANGLES

Use a shackle or oblong master link when working with low horizontal angles. Both can be used with included angles up to 120°.

Refer to American Society of Mechanical Engineers ASME B30.10 for a discussion of hooks, inspection procedures and operating practices.
RINGS & LINKS

While alloy steel rings and links may be used individually for lifting and rigging applications, they are used most frequently as components of a sling. Rings and links are sized for use with Grade 80 or Grade 100 chain and enable the user to construct a balanced sling system for lifting and rigging. We offer a variety of rings and links suitable for overhead and non-overhead lifting applications, explained in detail below.

OVERHEAD LIFTING RINGS & LINKS

MASTER RINGS
Master Rings are an important part of most rigging applications and can be used universally because of their round configuration.

OBLONG MASTER LINKS
Featuring an optimum design for sling construction, Oblong Master Links have a greater capacity when compared with master rings of the same size because of their smaller width. Oblong master links’ oval shape is also ideal for use with crane hooks, since the depth of a crane hook is normally greater than the width.

PEAR-SHAPED MASTER LINKS
These links may be used for the same applications as oblong master links, but their design is not optimum for multiple branch slings and, in some cases, may interfere with the crane hook.

OBLONG MASTER LINK SUB-ASSEMBLIES
Designed primarily for constructing slings with multiple branches, Oblong Master Link Sub-Assemblies allow you to construct a sling using mechanical couplers between the welded master couplers and the chain branches.

GRAB LINKS
Grab Links can be used to create a variable length loop-type sling. The grab link design captures a link of the chain in the link slot – similar to that of a grab hook. Grab links have a narrow neck, which restricts their use.

HAMMERLOK® COUPLING LINKS
Constructed of drop forged alloy steel and used primarily in the construction of overhead lifting slings. Specifically used for connecting the chain branches to the master link and to the hook attachments. Dual-rated Hammerloks® meet the strength levels of Grade 80 and 100. Must be matched to the chain size. Not to be used for repair or splicing of the chain.

OMEGALOKS
CM Omegaloks offer an alternative to the CM Hammerlok® as a mechanical coupler. The load and retain pin design is similar to the trademarked Clevlok® connectors. Dual-rated Omegaloks are designed to be used in conjunction with ML Series Master Links and are 100% proof tested. They can also be field installed.
NON-OVERHEAD LIFTING RINGS & LINKS

MID-LINKS
Mid-Links are typically used for quick repair, both temporary and permanent, of chain or for attaching chain hooks, rings and swivels to chain. They should not be used for overhead lifting. Can be used for cargo securement.

REPAIR LINKS
Made of low carbon steel, Repair Links are used to permanently mend and repair chain. When using repair links, chain links and attachments are threaded into the repair lap link and the link is flattened. Repair links should not be used for overhead lifting or cargo securement and tie-down.

CONNECTING LINKS
Connecting Links are a type of repair link intended for use with Grade 30 chain. To use connecting links, both halves of the link are placed together and small protrusions are peened over. Connecting links should not be used for overhead lifting or cargo securement and tie-down.

COLD SHUTS
Cold Shuts are a semi-permanent repair link for use with Grades 30 and 43 chain. To use a cold shut, thread a link onto the chain and insert the plain end through the hole in the link and peen over to secure. Cold Shuts should not be used for overhead lifting or cargo securement and tie-down.

LINK INSPECTION & USE

INSPECTION:
Care should be exercised so that the ring and link(s) are not abused in any way during use.
▲ Links should not be subjected to bending or exposed to sharp corners or objects.
▲ Avoid exposure to corrosive mediums or high temperatures.

Visually inspect all rings and links before each use for the following conditions:
▲ Twists or bends
▲ Nicks or gouges
▲ Excessive wear at bearing points (innerlink area)
▲ Elongation (link elongation)
▲ Corrosion or other obvious damage

Since any of these conditions can affect the strength of the attachments shown above, a qualified person should conduct the inspection and determine whether replacement is necessary.

WARNING
Improper use or care of rings and links can result in bodily injury or property damage. To avoid injury:
▲ Always inspect before use for wear, damage, and elongation.
▲ Do not use if excessively worn or damaged.
▲ Never exceed the working load limit.
▲ Ensure the proper size link is used, and the working load limit of the ring or link is equal to or greater than the working load limit of the chain.
▲ Do not impact or shock load. Apply load slowly.
▲ Do not use on oversize crane hooks where link does not fit in saddle of the hook.
▲ Protect from corrosion.
▲ Use only alloy chain and attachments for overhead lifting.
▲ Do not use Hammerlok® coupling links or any of the couplers shown above to repair alloy chain for overhead lifting.
**SHACKLES**

Columbus McKinnon prides itself on providing the strongest and most reliable shackles on the market. We carry a full line of anchor and chain shackles, manufactured through our state-of-the-art forging process in Chattanooga, Tennessee*.

CM shackles are available in four materials, including carbon, super strong, U.S. alloy and German alloy. Our innovative Super Strong Shackles are unique in the industry, featuring strength ratings up to 50 percent stronger than comparable sized carbon shackles and a 6:1 design factor for ultimate safety.

CM shackles are available in a three styles: Screw Pin; Bolt, Nut & Cotter; and Round Pin. Learn more about the uses and benefits of each shackle style below.

* Some higher-capacity shackles are forged from high-quality German alloy steel at our STB facility in Hamm, Germany and then finished in the U.S.A.

**BOLT, NUT & COTTER SHACKLES**

Of all shackle types, Bolt, Nut and Cotter Shackles provide the most secure pin arrangement, resisting axial and torsional loading. This type of shackle should be used in semi-permanent applications where the pin is removed infrequently or where cyclical loading occurs. This is the preferred type of shackle in areas that are difficult to reach or inspect. Recommended for overhead lifting, bolt, nut and cotter shackles are available in capacities up to 150 tons.

**SCREW PIN SHACKLES**

Screw Pin Shackles allow for quick and easy removal of the screw pin, which makes this style ideal for applications where the shackle is removed frequently. While the threaded pin can resist axial forces, it should not be cyclically loaded and is unreliable and vulnerable to backing out in applications where the pin is subjected to a torque or twisting action. Recommended for overhead lifting, screw pin shackles are available in capacities up to 43 tons. Screw pins should be moused in some applications.

**ROUND PIN SHACKLES**

Round Pin Shackles allow for easy removal by simply removing the cotter that holds the pin in place. These shackles perform well where the pin is subjected to a torque or twisting action, but they should not be subjected to an axial load. Round pin shackles are available in capacities up to 43 tons and are not recommended for overhead lifting.

### 4 TYPES OF SHACKLE MATERIAL

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>STYLE</th>
<th>WLL (TONS)</th>
<th>SIZES (IN.)</th>
<th>STYLES</th>
<th>DESIGN FACTOR</th>
<th>FINISHES</th>
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<tbody>
<tr>
<td>CARBON</td>
<td>Anchor</td>
<td>1/3 to 85 ton</td>
<td>3/16” to 3”</td>
<td>Bolt, Nut &amp; Cotter;</td>
<td>6:1</td>
<td>Orange Powder Coated, Galvanized</td>
</tr>
<tr>
<td></td>
<td>Chain</td>
<td>1/2 to 35 ton</td>
<td>1/4” to 2”</td>
<td>Screw Pin; Round Pin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUPER STRONG</td>
<td>Anchor</td>
<td>1/2 to 55 ton</td>
<td>3/16” to 2-1/2”</td>
<td>Bolt, Nut &amp; Cotter;</td>
<td>6:1**</td>
<td>Orange Powder Coated, Self Colored, Galvanized</td>
</tr>
<tr>
<td>17 to 50% stronger than comparable-sized Carbon</td>
<td>Chain</td>
<td>3/4 to 35 ton</td>
<td>1/4” to 2”</td>
<td>Screw Pin; Round Pin</td>
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<td></td>
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<tr>
<td>ALLOY (U.S.)</td>
<td>Anchor</td>
<td>2 to 120 ton</td>
<td>3/8” to 3”</td>
<td>Bolt, Nut &amp; Cotter;</td>
<td>5:1</td>
<td>Orange Powder Coated, Self Colored, Galvanized</td>
</tr>
<tr>
<td>~50% stronger than comparable-sized Carbon and ~25% stronger than Super Strong</td>
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<td></td>
<td></td>
<td>Screw Pin; Round Pin</td>
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<tr>
<td>ALLOY (GERMAN)</td>
<td>Anchor</td>
<td>85 to 150 ton</td>
<td>2-1/2” to 3-1/2”</td>
<td>Bolt, Nut &amp; Cotter</td>
<td>5:1</td>
<td>Self Colored, Galvanized</td>
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</tbody>
</table>
Wire rope is frequently used to make slings for rigging applications. The CM portfolio of wire rope attachments, including wire rope clips, thimbles and turnbuckles, are used to secure loops or turn back wire rope when used as part of a sling. Learn more about our specific wire rope attachment products and their uses below.

**Wire Rope Clips**

Wire Rope Clips are used to secure the end of wire rope when forming a loop; i.e., for wire rope turn-back. Clips are available in two configurations: mid-grip (double saddle) and single saddle. Each configuration is equally strong and effective, but care must be exercised for proper installation of single saddle clips; i.e., saddle must rest against live end of wire rope. All clips should be used in conjunction with a wire rope thimble and may require torqueing.

**MID-GRIP WIRE ROPE CLIPS**

The CM Mid-Grip is designed for applications in the scaffolding industry. The redesigned mid-grip features a hexagon bolt head that fits securely into a forged, hex-shaped socket that prevents spinning even after repeated use and re-torqueing. It has precise threading on the nut and bolt to ensure tight alignment. This design also allows for full arc wrench swing, making installation and retightening quick and easy. The mid-grip meets FF-C-450 performance requirements and comes with a smooth, mechanical galvanized finish for protection in harsh environments.

**Bundling Clips**

The CM Bundling Clip is built for harsh environments and demanding applications of the oil and gas industry. They are user-friendly with an easy-to-assemble, U-shaped design, allowing for fewer dropped or lost parts. The CM bundling clip design eliminates shear points and damage to wire rope, and prevents the choker from going slack and the load spreading after tension is released from the sling.

**PiggyBack® Wedge Socket Clips**

The CM PiggyBack® Wedge Socket Clip is the only clip on the market specifically designed for securing the dead end of a wire rope on a wedge socket. Its revolutionary dual saddle design attaches quickly and easily to prevent crimping and damage to the live end of wire rope and eliminates the need for a short rope piece or loop on dead end. Properly secured dead end will not snag/foul and shear off at wedge socket. Available in 3/8 inch to 1-1/2 inch sizes. Hot dip galvanized with orange painted U-bolts and drop forged saddles.

**Wire Rope Thimbles**

Used in conjunction with wire rope clips, CM Wire Rope Thimbles are made specifically for wire rope turnback to form a cable loop. Available in sizes to fit a maximum wire rope diameter of 1-1/2 inch and manufactured of hot rolled steel in accordance with Fed. Spec. FF-T-276.

**Steel Swaging Sleeves (Flemish Eye)**

These carbon-steel, seamless sleeves are used to securely anchor the strand ends of wire rope formed into a Flemish eye. CM Swaging Sleeves are zinc plated for rust resistance and color coded in smaller sizes for inventory control purposes and easy swaging verification. Available in sizes for 1/4 to 2-1/4 inch rope diameter.

**Steel Swage Buttons**

Steel Swage Buttons are typically used as wire rope terminations, but may be used at any rope location. Designed for use with 6 x 7, 6 x 9, or 6 x 37 wire rope of IPS or XIP (EIP), RRL, FC, or IWRC configurations. Made of specially selected low-carbon steel, CM steel swage buttons are available in sizes for 1/4 to 1-1/2 inch rope diameter.

**Swage Sockets (Open & Closed)**

These forged, fine-grain, carbon-steel swaging sockets are used as wire rope terminations. For use with 6 x 19 or 6 x 37 IWRC regular lay rope. Available in sizes for 1/4 to 1-3/4 inch rope diameter.

**Swivels**

Swivels are used for eliminating twists in rope and chain load lines. CM swivels are forged of carbon steel and hot dip galvanized. They meet performance requirements of RR-C-271, Type VII, Class 2, and are available in 3/4 and 1 inch nominal diameter sizes.

**Turnbuckles**

Turnbuckles provide easy means for tensioning, loosening and removing chain and rope load lines. CM Turnbuckles are forged then hot dip galvanized. All meet Federal Specification FF-T-791b Type 1, Form 1. Turnbuckles are available in eye and eye, hook and hook, hook and eye, eye and jaw, and jaw and jaw styles in sizes from 1/4 to 1-1/2 inch thread diameter.
LOAD SECUREMENT

Load securement, also known as tie-down or load binding, can be a complex rigging application that often has strict specifications and regulations. CM offers a number of load securement products, including load binders, binder chain assemblies and tie-down hooks, that help you safely secure loads for transport as well as meet federal, state and Commercial Vehicle Safety Alliance (CVSA) regulations. Our load securement products comply with the National Association of Chain Manufacturers (NACM) Welded Steel Chain specifications and the American Society for Testing and Materials (ASTM) specifications. They are also designed to meet applicable Federal Motor Carrier Safety Administration (FMCSA) rules for cargo securement.

LOAD BINDERS

Load Binders are typically used to take up slack and apply tension to a tie-down system. Designed primarily for use with graded chains, they can also be used with cable, steel strap or fiber webbing to secure loads in a variety of applications. Load binders are available in two general configurations: Lever-type (over the center) and Ratchet-type. CM load binders are rated by working load limit and are provided with the appropriate hooks to accept the chain size and grade consistent with the binder’s load rating.

LEVER-TYPE LOAD BINDERS

Lever-Type, or over-the-center, Binders utilize mechanical advantage to reduce the manpower required to secure a load. When using a lever-type load binder, tension can be applied and released quickly. Operators should use caution, as the handle may whip suddenly. When securement is complete, the lever stores in line with load.

RATCHET-TYPE LOAD BINDERS

Ratchet Binders utilize a screw or rotating motion to tighten and secure loads. Ratchet binders tighten slower but are easier to operate than lever-type load binders. They also do not require a handle to lock in place to ensure the binder stays tightened. Available with a variety of end fittings.

RIVER RATCHETS

River Ratchets operate similar to ratchet-type load binders, but have a substantially larger capacity. Typically, these ratchets are used to gang barges utilizing a gravity-operated, double-pawl design. River ratchets are available with a variety of attachments.
**BINDER CHAIN ASSEMBLIES**

Binder Chain Assemblies are most often used to secure loads to trucks, rail cars or truck trailers. They typically consist of a length of chain ranging from 6 to 26 feet in length with a grab hook at each end. The grab hook can be clevis style or eye style depending on your application. Standard binder chain assemblies are available in Grades 30, 43, 70, 80 and 100.

**CLEVIS HOOK ASSEMBLIES**

Clevis Hook Assemblies are available in various lengths and grades, depending on your application. CM offers different dimensional binder chains as part of these assemblies, including short link chain, which provides you with easier take up and better cornering, or traditional pitch chain that gives you less pounds per foot in weight.

**EYE HOOK ASSEMBLIES**

Similar to CM clevis hook assemblies, Eye Hook Assemblies prevent the loss or theft of hooks from the binder chain. Eye hook assemblies are offered with short or traditional pitch chain.

**TIE-DOWN HOOKS**

Tie-down Hooks come in various grades, designs and installation types. Both clevis and eye style tie-down hooks are high-quality forgings made here in the U.S. The clevis style hook is most popular because of the ability to self-install with limited need for tools. The eye style hook is typically factory installed during a welding process, but is beneficial in that it protects against loss or theft of the hook.

**GRADE 30 & 43 HIGH TEST HOOKS**

Grade 30 and 43 Hooks are dual rated, allowing the operator to use with both grades of chain. Grade 30 and 43 hooks are available in both clevis and eye types in either slip or grab styles and should be selected based on the type and grade of chain being used in the application. Available in self-colored or zinc-plated finishes.

**GRADE 70 TRANSPORT HOOKS**

Transport Hooks are available in both clevis and eye types in either slip or grab styles. These hooks are rated for use with Grade 70 chain and are available in self-colored or yellow chromate finishes.

**GRADE 80 HEAVY-DUTY HOOKS**

Grade 80 Hooks available in both clevis and eye types in either slip or grab styles and are rated for use with Grade 80 chain. Grade 80 clevis-style hooks are marked “T80” and should not be used for overhead lifting because of their pin and cotter design. These hooks are available in self-colored or orange powder-coated finishes.