This document contains warnings and use limitation information applicable to Gunnebo Lifting’s GrabiQ G100 Alloy Steel Chain Slings and components and is furnished with all Gunnebo Johnson Corporation shipments. Component distributors and lift system manufacturers must pass on this information in their warnings and use limitation literature where Gunnebo Lifting G100 chain or components are involved.

**WARNING AND USE LIMITATIONS**

Never use a sling without training…OSHA regulation requires responsible work practice.

“The employer shall permit only those employees qualified by training or experience to operate equipment or machinery” – OSHA 1926.20 (a)(4).

Employee training should include information given in OSHA training literature, ASME B30.9 – 2003 “Slings” and ASME B30.10 – 2005 “Hooks” safety standards and this document.

Always inform yourself…Ask your employer for chain sling safe use instruction.

“The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury” – OSHA 1926.21 (b)(2).

Always comply with applicable Federal and local regulations…Federal and local regulations govern worksite activity.

Understand all governing laws and safety standards before use of chain slings. OSHA 1910.184 and 1926.251 regulates chain sling safe operating practices, product identification, inspection requirements, and use limitations. ASME B30.9-2003 “Sling” safety standard provides additional recommendations for chain sling use.

“If a particular standard is specifically applicable to a condition, practice, means, method, operation, or process, it shall prevail over any different general standard…” – OSHA 1910.5(c)(1).

Contact OSHA at (800) 321-6742, or www.OSHA.gov and ASME at (800) 843-2763, or www.ASME.org for reference assistance.

Always know load weight…Avoid sling failure.

“The rated load of the sling shall not be exceeded.” – ASME B30.9-1.10.1(c).

Weight of the load to be lifted must be known for determination of proper sling configuration and working load limit.

Never use a sling without a legible identification tag…Sling Identification is required to ensure proper sling application.
Alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity, and reach." – OSHA 1910.184 (e) (1).

“Hooks, rings…or other attachments shall have a rated capacity equal to the alloy steel chain with which they are used or the sling shall not be used in excess of the rated capacity of the weakest component…." – OSHA 1910.184(e)(2)(i).

“Makeshift links or fasteners shall not be used.” – OSHA 1910.184(e)(2)(ii).

GrabIQ components shall be used only with Gunnebo Lifting Grade 100 Alloy Steel Chain.

Product identifier is forged into GrabIQ sling components and is designated as GrabIQ-(Model Designator) – (Trade Size) – (Grade); Example: GrabIQ-MG-13-10.

Gunnebo Johnson Corporation has available a blank identification tag, attached by a cable tie, to be stamped with sling WLL, minimum working range angle, serial number, chain size, grade, reach, type and manufacturer. Order 547303 for replacement.

Grade of component with the lowest breaking strength shall be specified on the identification tag. Nonstandard grades shall be designated by “NS”.

Working Load Limit (WLL) is the maximum working load for a specified working range. Sling working range includes sling leg angles from 90° to a specified minimum. The specified minimum working range angle is given on the identification tag.

Working load is to be applied vertically to a sling assembly having symmetric leg angles. WLL applies to loads lifted vertically and does not include torsional, binding, shock or non-symmetrical load effects.

Gunnebo Lifting’s GrabIQ Grade 100 Alloy Steel Chain Sling Working Load Limits for selected working ranges of symmetric sling leg angles are listed in pounds and given in TABLE 1. No chain sling shall be rigged with a leg angle less than 30° from the horizontal.

Double Leg Sling WLL for an alternate working range of symmetric sling leg angles equals (=) 2 × TABLE 1 single leg WLL × sine of the minimum working range angle.

Triple and Quadruple Leg Sling WLL for an alternate working range of symmetric sling leg angles equals (=) 3 × TABLE 1 single leg WLL × sine of the minimum working range angle.

Multi Leg Sling WLL for non-symmetrical loading can only be determined by engineering analysis of the specific rigging condition. In the absence of an engineering analysis, WLL shall be equal to single leg sling WLL given in TABLE 1. Choked endless chain sling WLL for selected working ranges of symmetric leg angles are listed in pounds and given in Table 3.

TABLE 4 illustrates choke angle and gives Choked WLLs as a percentage of Table 1 WLL for full range of choke angles.

<table>
<thead>
<tr>
<th>TABLE 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHOKED ANGLE (°)</strong></td>
</tr>
<tr>
<td>120 - 180</td>
</tr>
<tr>
<td>90 - 119</td>
</tr>
<tr>
<td>60 - 89</td>
</tr>
<tr>
<td>30 - 59</td>
</tr>
<tr>
<td>0 - 29</td>
</tr>
</tbody>
</table>

**Working Load Limits are valid between temperatures of –40° and 400°F**

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Gunnebo Lifting’s GrabiQ Grade 100 “Loop Leg” Sling Working Load Limits for selected working ranges of symmetric sling leg angles are listed in pounds and given in Table 5.

A “Loop Leg” hitch is a type of basket hitch made with a single GrabiQ fitting having an integral chain pocket. The Loop Leg Hitch included angle is limited to a maximum of 30° or a L/W ratio of 2 or greater and shall not be rigged with a leg angle less than 45° from horizontal as illustrated by the figure below. Sling leg angle is defined by the leg of the “Loop” with the smallest angle.

A basket hitch made with both chain ends terminated by a GrabiQ Clevis connection on the same fitting or to a separate fitting is a conventional basket hitch and is illustrated by the figure below.

A basket hitch made with both chain ends terminated by a GrabiQ Clevis connection on the same fitting or to a separate fitting is a conventional basket hitch and is illustrated by the figure below.

Gunnebo Lifting’s GrabiQ Grade 100 Conventional Basket Sling working load limits for selected working ranges of symmetric sling leg angles are listed in pounds and given in Table 1. Conventional basket hitch is limited to single and double leg slings and shall not be rigged with a leg angle less than 30° from the horizontal.

- Never overload a sling…Understand Working Load Limits.
- “Slings shall not be loaded in excess of their rated capacities.” – OSHA 1910.184 (c)(4).
- “The design factor for alloy steel chain slings shall be a minimum of 4” – ASME B30.9-1.4.
- Standard Gunnebo Lifting Working Load Limits (WLL) are based on a 4 design factor. Lift dynamics, duty cycle and hitch type may require an increased design factor, hence a reduced WLL. Inattention to required design factor can result in sling overload. Contact Gunnebo Johnson Corporation Service Department for assistance at (800) 331-5460.
- Sling WLL depends on sling leg angle. The WLL for a sling is reduced as the sling leg angle with the horizontal gets smaller. This fact applies to all multi-leg slings and must not be ignored.
- The following diagram illustrates the effect of sling leg angle on the WLL for a 2-leg sling.
- The WLL of a sling with a 30° leg angle is 50% of the WLL for the same sling with a 90° leg angle. Inattention to the effect of sling leg angle can result in sling overload.
- Chain sling WLL is to be reduced in accordance with TABLE 6 when chain is rigged over an edge radius (R) less than two (2) times the chain rod diameter (D).
- Reduced WLL equals chain sling WLL from identification tag reduction factor.

### Table 5

<table>
<thead>
<tr>
<th>GUNNEBO LIFTING G100 CHAIN SIZE</th>
<th>SINGLE LEG</th>
<th>DOUBLE LEG</th>
<th>TRIPLE &amp; QUAD LEG</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM.</td>
<td>90°</td>
<td>90° - 60°</td>
<td>90° - 45°</td>
</tr>
<tr>
<td>8</td>
<td>5,700</td>
<td>9,900</td>
<td>14,800</td>
</tr>
<tr>
<td>10</td>
<td>8,800</td>
<td>15,200</td>
<td>22,900</td>
</tr>
<tr>
<td>13</td>
<td>15,000</td>
<td>26,000</td>
<td>39,000</td>
</tr>
<tr>
<td>16</td>
<td>22,600</td>
<td>39,100</td>
<td>58,700</td>
</tr>
</tbody>
</table>

*Working Load Limits are valid between temperatures of –40° and 400°F.*
Never ride on sling or load…Avoid death or injury.

Sling use regulation requires: “All employees shall be kept clear of loads about to be lifted and of suspended loads.” – OSHA 1910.184 (c) (9).

General worksite regulations require “No hoisting, lowering, swinging or traveling shall be done while anyone is on the load or hook assembly.” - OSHA 1910.180 (h) (3) (v).

Construction worksite regulation stipulates: “The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling, of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous or is not possible because of structural design or worksite conditions.” - OSHA 1926.550 (g) (2).

GrabiQ alloy steel chain slings shall not be used to rig personnel platforms.

Self-locking hooks shall not be used in personnel lift systems unless complying with applicable federal or local lift system and fall arrest regulations and TABLE 8A and TABLE 8B.

Never rig a sling to a load improperly…Avoid dropped loads and sling damage.

“Safe operating practices…” – OSHA 1910.184 (c)
“Operating practices…” – ASME B30.5-3.2
“Operating practices…” – ASME B30.9-1.10
“Operating practices…”
(c) Load shall be centered in the base (bowl/saddle) of the hook to prevent point loading of the hook. (See Figure 1a, 1b, & 1c)
(d) Hooks shall not be used in such a manner as to place a side load or back load on the hook. (See Figure 2a & 2b)
(e) When using a device to close the throat opening of the hook, care shall be taken that the load is not carried by the closing device. (See Figure 3a & 3b)
(f) Hands, fingers, and body shall be kept from between hook and load.

(i) The use of a hook with a latch does not preclude the inadvertent detachment of a slack sling or a load from the hook. Visual verification of proper hook engagement is required in all cases.

(j) Self-locking hooks shall be locked during use.

(k) When a hook is equipped with a latch, the latch should not be restrained from closing during use.” – ASME B30.10-1.3.

Hooks shall not be rigged with more than two (2) sling legs in the hook saddle and sling leg angles shall not be greater than 45° from hook centerline. (Figure 1b)

Hooks shall be rigged with a master ring or shackle when three (3) or more sling legs are used or sling leg angles exceed 45° from hook centerline. (Figure 1c)

Sling leg angle shall not be less than 30° from the horizontal.

Slings shall be shortened with a shortening fitting only and not with knots or bolts or other makeshift devices.

Slings shall not be kinked or twisted.

Slings shall not be point loaded.

Slings may be mandatory by regulation, safety codes, or insurance.

Slings used in a basket hitch shall have the loads balanced to prevent slipping.

Slings shall be securely attached to their loads.

Slings shall be padded or protected from the edges of their loads when the edge radius is less than .5 of the chain rod diameter (d). See TABLE 6.

Sling shall be rigged to prevent chain from sliding over a load edge while lifting.
WARNING AND USE LIMITATIONS

The maximum number of GrabiQ fittings to be connected to a master link is three as illustrated in Figure 2.

FIGURE 2

Sling shall not be used unless the GrabiQ coupler of at least one end of each chain leg is secured to the masterlink by one of the retainer and keeper methods illustrated in Figures 3 & 4.

Free end of sling leg when connected to a master link with a GrabiQ coupler does not require a retainer. However, either method illustrated in Figures 3 and 4 may be used when desired.

FIGURE 3

FIGURE 4

Gunnebo Lifting is now offering dismountable and permanent connections.

- **Never use a worn-out or damaged sling.**

“Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use where service conditions warrant. Damaged or defective slings shall be immediately removed from service” – OSHA 1910.184 (d).

“In addition to the inspection required by paragraph 1910.184(d), a thorough periodic inspection shall be made on a regular basis, to be determined on the basis of (A) frequency of sling use; (B) severity of service conditions; (C) nature of lifts being made; and (D) experience gained on the service life of slings used in similar circumstances. Such inspections shall in no event be at intervals greater than once every 12 months.” – OSHA 1910.184(e)(3)(i).

“The thorough inspection of alloy steel chain slings shall be performed by a competent person designated by the employer, and shall include a thorough inspection for wear, defective welds, deformation and increase in length. Where such defects or deterioration are present, the sling shall be immediately removed from service.” – OSHA 1910.184(e)(3)(iii).

“Worn or damaged alloy steel chain slings or attachments shall not be used until repaired.” – OSHA 1910.184(e)(7)(i).

Chain sling with reach longer than given on identification tag shall be immediately removed from service and evaluated for wear and material stretch.

Chain link wear is limited by minimum cross-sectional dimensions given in TABLE 7. Chain worn below the given limits shall be removed from service.

Chain Sling connector or attachment with wear greater than 10 percent of the original dimension for any cross-section shall be removed from service.
Chain sling GrabiQ coupler, chain, master ring, sub-link, hook or attachment that is broken, cracked, bent, stretched or twisted shall be removed from service and shall not be repaired.

Chain sling with a GrabiQ coupler, chain, master ring, sub-link, hook or attachment nicked, gouged or lapped shall be removed from service and shall not be returned to service unless properly repaired.

Hook latch, when required, shall be fully functional and properly seated.

Self-locking hook with latch tip opening greater than amount given in Table 8A and 8B shall be removed from service and shall not be returned to service unless properly repaired.

• Never use a sling in extreme temperatures.

“...alloy steel chain slings shall be permanently removed from service if they are heated above 1000°F...” – OSHA 1910.184(e)(6).

Alloy steel chain slings shall not be used while heated above 1000°F or cooled below -40°F.

Alloy steel chain sling Working Load Limits (WLL) given in TABLE 1, 2, 4, and 5 are valid between temperatures of -40°F and 400°F.

Alloy steel chain sling WLL shall be reduced in accordance with TABLE 9 when heated between 400°F and 1000°F.

Permanent WLL reduction shall be made in accordance with TABLE 9 for chain slings heated over 400°F. Identification tag shall be replaced and the new tag shall have the reduced WLL.

• Never use a sling in alkaline or acidic conditions.

Gunnebo Lifting’s GrabiQ Grade 100 (G10) alloy steel chain and components shall not be used in alkaline or acidic conditions. Resulting metal embrittlement and accelerated corrosion can cause sudden sling failure. Hot dip galvanizing and electro-zinc plating of alloy steel chain shall be done only by Gunnebo Lifting.